GAS JOURNAL

LIGHT ⁂ HEAT ⁂ POWER ⁂ BYE-PRODUCTS

(Founded in 1849 as the "Journal of Gas Lighting.")

PROPRIETORS: WALTER KING, LIMITED. OFFICE: 11, BOLT COURT, FLEET ST., LONDON, E.C. 4.

Telephone: Central 6055. —— Telegrams: "GASKING, FLEET, LONDON."

VOL. CLXXXIII. No. 3402.] WEDNESDAY, AUGUST 1, 1928. [80TH YEAR.

Arthur F. Bezant, Editor of the "Gas Journal," died at Heath Lodge, Shepherd's Lane, Dartford, on July 31, in his 64th year.

ARTHUR BEZANT.

IT is with deep regret that we make the above announcement. The gas industry has lost a staunch advocate; and many will mourn a wise counsellor and friend. None who read the brief and cheerful note in the "JOURNAL" three weeks ago—it was from his own hand, and at his own request the only intimation given of his illness—could have anticipated so early an end to a life of utility and service. A painful illness began to assert itself in February last, and a short rest at Eastbourne in April failed to achieve the hoped-for relief. Drastic treatment by his medical advisers could not break-down his determination to carry on "at any rate until after Institution Week;" but increasing disability finally led him to undergo treatment at a clinic in Windsor Forest. Thence he moved five weeks ago to his son's home, Heath Lodge, Dartford, where an initial promise of improvement was not maintained. A marked change for the worse supervened on Monday last, and he passed away peacefully yesterday morning—from first to last having evinced a fortitude and optimism far beyond the capacity of a weaker character. Throughout his illness he had continued his writing, and few there are who, with the sad news before them, will not marvel to learn that the Editorial Notes in last week's "JOURNAL" were from the pen of Mr. Bezant. He did indeed die in harness, uphill work though it had been for many months.

Arthur Fitzroy Bezant was born in Sudbury, Suffolk, in September, 1864. A chance inquiry by the late Walter King brought him to Bolt Court; and our friend was proud to have completed well-nigh fifty years' service with the "JOURNAL." At Bolt Court Arthur Bezant's assiduity and ambition quickly found him an established place. For him, the daily round and the weekly routine of Trade Journalism did not suffice; and he sought in all spare time to fit himself for the position he eventually attained—Editor of the paper he loved so well, and one whose counsel was valued by all who received it. Many a week-end in his younger days was spent in the assimilation of the theory and practice of gas-works plant. An expert shorthand writer, his work brought him into contact with the leaders in all phases of the gas industry's activities; and he was well-known in Parliamentary committee rooms at the time of the industry's dourest battles. Thus it came about that, when the call was made, Mr. Bezant was ready and eager to assume the responsibility of Editorial Writer to the "JOURNAL;" and for well over twenty years he has filled that rôle with energy and distinction. His brief annual holiday meant little more for him than a change of desk; always persuasion failed to induce him to shelve the writing of "leaders" and "Electricity Supply Memoranda" during the few weeks of absence.

When the toll of war years and sickness overtook the late Walter King in 1921, and the "JOURNAL" passed into the hands of a Private Company, Mr. Bezant willingly accepted the new régime, and the Board was strengthened by his sagacity and wide experience. On the death of Mr. Walter King, our first Chairman, he became Joint Managing Director, and was invited, as a mark of the family's esteem, to occupy the chair during 1922 and 1923. Items in his long years of work it is impossible to mention in this memoir; but the writer has always felt that an autobiography from Mr. Bezant's hand would be nothing less than an admirable synopsis of the gas industry's history during the last forty years. Surely, however, Mr. Bezant himself would have liked a record here of the part he took in 1904 in inspiring the formation of the "Society of British Gas Industries;" he always treasured the memory of the tribute paid him in that regard, at the Society's 1923 meeting, by his old friend Mr. Charles Clare and others. As an author he was responsible for "Competition Points for Gas Salesmen," a revised second edition of which was published, in collaboration with Mr. Norman Smith, as recently as 1926. His insistence upon the importance of the commercial side of the gas industry was typical of his breadth of view and the policy of looking forward, which he not only preached but practised assiduously. The "Gas Salesman" Supplement to the "JOURNAL" was the child of his brain.

The purely personal matter will be forgiven on this occasion; and thus mention may be made of the many kindnesses which Mr. Bezant bestowed upon the writer, both in his childhood days and when chance brought him to work with Mr. Bezant at the "JOURNAL" office. From the viewpoint of colleague, there will always remain uppermost in mind Mr. Bezant's quick perception of essentials, his power of analysis, his remarkable memory, and his solid application to the job in hand.

He leaves a widow and a son, who is in charge of the Dartford Works of the South Suburban Gas Company. To them and the family we extend our sincerest sympathy, to which will be joined that of the whole Gas Industry. The funeral will be at noon on Friday, at the Dartford Cemetery.

C. A. K.

The Tale of the Industry.

THE first part of another issue has now been published of the compilation by the Board of Trade of statistics relating to all authorized gas undertakings in Great Britain. It is a useful document, and one which the industry would find it difficult to do without. Thanks are due, therefore, to the Board of Trade for the great amount of time and trouble that must be devoted by them to the setting-out of the statistics. Though the name of "Return," which has for many years past been applied to this particular official paper, indicates that the figures are obtained from the various gas companies and municipally-owned concerns, the marshalling of the information presents a formidable task. Of the two parts of the yearly Gas Undertaking Return, the one subject to most general variation is that which deals with the manufacture and supply of gas; and it is this part, covering the year 1927, which was referred to in last week's "JOURNAL," and is dealt with at greater length in the present issue.

These statistics, which constitute what might be called the "Blue-Book" of the gas industry, always invite comparison, one year with another; but differing circumstances have, since that never-to-be-forgotten year 1914, been apt to render such comparisons misleading. Time was when each year, with unfailing regularity, registered its satisfactory increase in consumption of gas, and when, after such registration, the industry settled itself down comfortably for "another lap"—we had almost been tempted to write "another nap." All this, however, has changed. Increases in consumption do, it is true, continue to follow one another with the old regularity—though 1921 recorded a break in this long line of success—but they vary in proportion, as they are subject to circumstances over which the industry is unable to exercise control. For example, looking back over three years, we find that the quantity of gas sold during 1925 was 3·5 p.ct. in excess of that sold in 1924. The next year, 1926, showed an increase of 4·07 p.ct. in the gas sold as compared with 1925. And now we have 1927 exhibiting an increase of no more than 1·3 p.ct. in gas sales over 1926. It is not necessary to remind our readers of all that has occurred within this short period of three years to influence the consumption of gas; no one is likely yet to have forgotten this little piece of history. When the miner goes on strike, the loss he occasions spreads far indeed beyond his own hearth. Were it not so, he would more readily be left to his own devices. The gas industry needs cheap coal, and has been prevented from getting it; trade in general has been bad; and increases in price of gas have been compelled, as is usual in cases of this kind, just at a time when most unwelcome. However, small as it is in percentage, the year 1927 does record an increase in gas consumption which, in volume, is represented by the substantial amount of 3633 million c.ft. Not so bad in all the circumstances; but the industry will see to it that it is left well behind when the record of 1928 comes to be chronicled.

The sales of gas, though from most points of view the feature of prime importance in this part of the return, are by no means the only one that is likely to arrest attention. One is told, for instance, that in the past year, although the quantity of gas sold increased by 1·3 p.ct., the amount made was only 0·5 p.ct. in excess of 1926. Here is a point upon which the distribution departments are to be congratulated. In so far as the stability of the industry derives greater assurance from a widening of its base, there is ground, too, for satisfaction that, whereas the number of consumers increased in 1926 by 2·49 p.ct. over those of 1925, the year 1927 shows in this respect an increase of 3·3 p.ct. over 1926. There were in Great Britain at the close of 1927 no fewer than 8,686,339 consumers connected up to the mains of the 782 authorized gas undertakings; and it is of interest to note that the prepayment consumers largely outnumber those taking gas through ordinary meter. To be precise, the prepayment consumers total 4,787,278, and the ordinary ones 3,899,061. When these figures are dissected, it is seen that in Scotland the proportionate number of consumers using prepayment meters is much smaller than is the case in England. There are various reasons which suggest themselves for this; and one might easily in the first place hit upon the wrong explanation. Possibly the reason is that fewer facilities can be offered in Scotland for this elsewhere popular method of gas consumption than are practicable in the large number of more densely populated areas in England.

Other matters emerging from the statistics include the fact that, though there is still a lengthy list of undertakings whose maximum proportion of water gas supplied reached 25 p.ct., the total output of water gas in 1927 was as much as 27·8 p.ct. below the abnormal figure reached in 1926, and very slightly less than the quantity made in 1925. Slowly the remaining undertakings are coming under the Gas Regulation Act; and last year, of the total quantity of gas sold by all statutory concerns, approximately 83 p.ct. was sold on the thermal basis. In 1927 some 1400 miles of mains were added to the total canalization of the undertakings; and it is—in view of the claims of our electrical friends—somewhat curious to note that (omitting 1926, when there was enforced economy in this respect) the quantity of gas sold for public lamps last year was very nearly as much as in 1925. When improved equipment, giving greater illumination with a smaller consumption of gas, such as was referred to at the recent Sheffield conference of the Association of Public Lighting Engineers, is taken into account, there appears to be little ground for despondency here. Just one other feature of the return calls for mention, and that is the table relating to the quantity of gas bought from owners of coke ovens by authorized gas undertakings. Again omitting 1926, when for a long time coke oven gas was to so large an extent unprocurable, it is seen that in 1927 the amount of coke oven gas so purchased was 5,340,223,000 c.ft., while the total for 1925 was 4,797,752,000 c.ft.; three gas undertakings having in the meantime been added to the number of purchasers.

The "M.A.N." Holder at Work: A Welcome Record.

A GOOD many years have passed since the invention of the tankless gasholder; and when the attention of the British gas industry was finally focussed upon the type—through the Douai visit during the 1924 Centenary of the French Gas Association, and M. Rolland d'Estape's paper at our 1925 Institution Meeting—the M.A.N. Company had already gained a substantial hold in Germany and America. At that same memorable meeting in Paris, a paper was presented descriptive of the structure and the mechanical parts of the Nuremberg design; the possible advantages and disadvantages of the "dry" holder were freely discussed; and speculation arose among the English contingent as to how soon one of their countrymen would break with tradition and try-out the new idea. Then the breath of controversy was aroused by the unfortunate occurrence at Posen in 1926; and soon afterwards the word went round that the industry in this country had found a pioneer in Ipswich, and that the greatest gas company in the world were also minded to put the claimed advantages to test.

Now the controversy throughout has turned mainly upon two points in the waterless holder—the security of the seal around the disc, and the question of the most suitable sealing liquid—and, once chosen, of maintaining its characteristics in face of physical conditions within and without the shell. There has been no lack of assurance from among the champions of the system that doubts were misplaced; but all along we have eagerly awaited chapter and verse to qualify the bare assertion. Therefore we welcome the paper which the Société d'Eclairage, Chauffage et Force Motrice, through the medium of M. A. Bazille, presented at the 51st Congress, in June, of the French Gas Industry. Therein is set out an account of the working and control of a 200,000 c.ft. M.A.N. holder which was commissioned in November, 1925, to deal with the make from a large carburetted water gas plant at the Gennevilliers Works in Paris.

It would seem that the one occurrence which aroused in the "E.C.F.M." apprehension as to the security of the seal—and this only in so far as extreme conditions might at some time develop—was the fairly prolific deposition of water in the holder. This water would in time find its

way through the syphon between tar channel and sump, and seriously interfere with the standard of the sealing liquid and with the periodicity of the pump runs. True, the eventuality was guarded against in the M.A.N. design, run-off cocks being provided to deal with the supernatant water; but here would be a strong point for those who argue that the gas storage "machine" requires supervision, in contradistinction to the gentle-mannered "holder." How the "E.C.F.M." overcame this obstacle is fully described in the paper. A simple syphon arrangement was designed by M. Russier; and an easy calculation of tar and water levels is explained. M. Bazille is now able to state without equivocation that "the modification puts the finishing touch to a system of gas storage that has developed far in Germany and is now extending in France and elsewhere." Since it has been applied, "the working of the holder has given rise to no criticism."

As regards the physical and chemical changes which conditions of work favour in the sealing medium, M. Bazille points out that the ideal of constant viscosity cannot be attained; but he has found that the various influences compensate each other to a considerable degree. The relevant section of his paper is of great interest, for to our knowledge the factors have not hitherto been presented in concrete form. In this instance the concrete is heavily reinforced by an admirable graph of the holder's working over the greater part of a year. Therein the conditions of working are seen at a glance, and note is made of the steps taken to approximate the ideal state of constant viscosity.

The Best is Good Enough.

THE slogan which the Gas Light and Coke Company have adopted in relation to their various schemes must be that "Only the Best is Good Enough." It is an excellent slogan; and it is leading the Company far. It has given them works that are provided with the finest engineering plant which can be designed for the purposes to be fulfilled; it has given them showrooms which are a pride and a joy to the industry on whose behalf they have been erected; it has given them training centres fitted with the most modern of appliances; and now it has given them laboratories which must prove of inestimable value both to the Company and to the carbonizing industry at large. The works and showrooms have, as occasion has demanded, been the subjects of illustrated descriptions in our pages; in this issue the new laboratories at the Fulham Gas-Works of the Company are similarly dealt with, and the accompanying photographs will be found to give a more adequate impression of the scheme than any words could do. Suffice it to say here that unstinted praise was bestowed upon them by the large party of distinguished visitors who were privileged to inspect them on the opening day. Some, indeed, of those who have trodden the paths of gas for many years were almost inclined to rub their eyes and wonder where they were.

Now all these things are the outward and visible sign of a breadth of vision and a large-minded policy which are full of promise for the future of the industry. Undertakings in all parts of the country have benefited from the showroom displays made by the Gas Light and Coke Company in the very heart of the British Empire; and all will likewise gain from the numberless important researches which will be undertaken in these new laboratories. For the Company would not, even if they could, keep to themselves the knowledge thus obtained by them. The honour of being the largest Gas Company in the world has fallen to the lot of those who are always willing to place their vast resources at the disposal of other members of the industry. This is, indeed, a feature of the gas industry of to-day; and may it be suggested that perhaps it provides an answer—or at any rate partially so—to a query raised by Sir Richard Threlfall, G.B.E., F.R.S. (the Chairman of the Fuel Research Board), in an address which he delivered on the occasion of the opening by him of these new laboratories? Sir Richard (in the course of remarks which were full of deep thought and of interest for his hearers) expressed some doubt as to the meaning of the phrase "team work." Might not some explanation be found in the example of the Gas Light and Coke Company, who, while rightly, and as in duty bound, looking after the interests of their own shareholders, are ever mindful of the fact that they are part of a great whole, and act accordingly? It would surely be wrong that "team work" should deprive a man of the credit for his own efforts; and there seems to be no reason why it should do so. Indeed, at the opening of the laboratories, Sir David Milne-Watson, D.L. (the Governor of the Gas Light and Coke Company), alluding to the undertaking of all these big schemes, remarked to the writer: "It "pays all the time." Of course, it does; but it is none the less "team work" for that.

Another Co-Operative Tar Scheme.

ALREADY co-operative tar schemes are in operation in the Southern and South-Western districts of England, in Yorkshire, in Lancashire, and in South Wales; and now we have another in the South-Eastern district of the country. The scheme actually came into practical working at the beginning of the year; and the area served by South-Eastern Tar Distillers, Ltd.—the names of the Directors of which are household words in tar distilling circles—is bounded, as the geography books say, on one side by the sea, and on the other by a line drawn from Gravesend to Guildford and from Guildford to Bognor. At present many gas undertakings in the area are participating, but doubtless the number will be swelled by new recruits as the virtues of the joint enterprise become more apparent. Not every gas undertaking has the facilities for producing at all times a refined tar suitable for road purposes; and if on occasion an inferior batch is supplied to the surveyor, the harm done affects not only the particular undertaking concerned, but the status of gas tar generally, and its popularity in what, perhaps, is its best sales outlet. Good tar of constant and correct quality is a splendid material for road dressing and surfacing. Proof of the recognition of this fact was afforded in the paper on "Road Tar and its Uses in Great Britain" which Mr. W. E. Cone, of the British Road Tar Association, read before the French Tar Producers' and Distillers' Association, in Paris, on July 2, an extract of which was published in the "JOURNAL" for July 18. Mr. Cone showed clearly that there is, on the part of surveyors and road users, a growing appreciation of the properties of tar. Far greater confidence than formerly is being reposed in it, and miles of roads constructed of other bituminous substances have been treated with tar to make them safe and tenable. The non-slipperiness of a tarred surface will doubtless be borne in mind by the Slippery Roads Committee, a deputation from which waited upon the Ministry of Transport last week. This deputation, which comprised delegates from no fewer than thirty-six societies interested in the use of the roads by horses and motors, are of opinion that present-day roads are dangerous and slippery to all forms of transport. We presume they were referring to roads which have not been treated with tar.

As is the case with the other joint enterprises, the object of South-Eastern Tar Distillers, Ltd., is to ensure that the gas undertakings who are co-operating will have a sales outlet for the tar they produce, and that the surveyors will always be happy in the knowledge that the tar they buy is eminently suited to their purposes. As mentioned, the scheme has been in operation since January; and already it has achieved considerable success. There are two distilleries, one at Canterbury and one at Tonbridge; and last Wednesday saw the official inauguration of the latter plant—a ceremony which was performed by Mrs. J. M. Campbell, the wife of the Engineer and Manager of the Isle of Thanet Gas Company. An account of the ceremony and a description of the works will be found on later pages of our issue to-day. Without going into detail here, it may be mentioned that the plant is admirably laid out to allow of future extensions, and that arrangements have been made for blending not only the crude tar as received from the various gas undertakings, but the refined product. By this means there is assurance that the final refined product supplied to surveyors will be up to specification. A point of extreme

interest is the method of transport. Mr. Cone, in the paper to which reference has been made, stated that "the transportation of large quantities of tar necessitates that advantage should be taken of improved methods." Improved methods are certainly utilized by South-Eastern Tar Distillers in this respect as in others. The material is carried in what must be Rolls-Royce among tar tankers. These are "Foden" vehicles capable of holding 2300 gallons, and equipped with steam coils to maintain the desirable temperature, and pumps for filling and discharging. Experience of co-operative schemes in other parts of the country has on the whole been good, and we therefore commend the latest arrival, and wish it success.

Railway Wage Agreement.

The efficiency of the railway service is of importance to every one of us—alike to individuals and to industry. It may be true—and no doubt it is—that road transport is daily increasing in volume and in power of performance; but, at any rate so far ahead as one is able to see at present, the railway system is likely to remain indispensable, though not to the same degree in every case. While some persons and some industries claim to have found the newer form of transport preferable to the old, others—including some of the most vital industries of the country—must continue to rely upon the "iron road." There is the gas industry, for instance, which, according to the newly-issued Board of Trade Returns, was responsible in 1927 for carbonizing in Great Britain over 17½ million tons of coal. Fast motor traffic would not be facilitated should some of the larger inland gas undertakings, situated a distance from the coalfields, decide to get in their supplies of coal by road; and it is unlikely that the efficient working of the undertaking itself would be aided by such a change. The gas industry, of course, is taken merely as the most obvious example for us in support of the argument of inter-dependence. It is a "public utility service;" and therefore those industries upon which it depends must be "public utility services" also. Thus it comes about that we must all be interested in the welfare of the railways.

A Good Example.

This being so, one notes with great relief that the commonsense view has prevailed in connection with the discussion between the managements of the railway companies and the leaders of the men's unions, upon a possible reduction of the wages bill. The agreement arrived at is of itself a great achievement; and if it secures the ratification of delegate conferences of the unions concerned, it will mark a big stage forward in methods of dealing with matters of this kind. Under this agreement, while standard wages and other conditions of employment remain unchanged, a 2½ p.ct. deduction is to be made from all wages and salaries. This deduction will apply to the officials as well as to the workpeople of every grade, including the men in the railway workshops. The Directors, also, have intimated that they will accept a similar deduction from their remuneration. The agreement will begin to operate as from the middle of this month; and it is anticipated that by it the saving to the railway companies will be somewhere round £3,000,000 per annum. There are, of course, other clauses; but the main factor is this assent to an all-round reduction in wages and salaries. The arrangement is of a temporary character, and is to be binding for twelve months, after which it may be terminated by three months' notice, either by the railway companies collectively or by the unions collectively.

Increased Charges No Remedy.

There is, too, another hopeful sign that the position of the railways may be bettered. The time when the business of the companies could be transacted on "monopolistic" lines has gone, and gone for ever; and railroad transport must now and henceforth be regarded as a keenly competitive industry. We have been accustomed in the past to encounter proposals for increased charges as the means of remedying downward tendencies of net revenue; but in the lately published report of one of the companies there is found this statement: "The Directors are satisfied that the policy of quoting cheaper fares and providing increased facilities is the only policy which, in the long run, is likely to re-establish the Company's passenger revenues in the face of increasing road competition. It must be recognized, however, that this policy does not permit of immediate economies, in the face of falling passenger revenues." Though passenger fares and facilities only are referred to, this statement will be welcomed also by industrialists, for it contains recognition of a fundamental commercial principle which should in time prove of immeasurably greater benefit to the railways than could any putting up of charges in face of this same "increasing road competition."

IRISH ASSOCIATION OF GAS MANAGERS.

Programme of Annual Meeting in Belfast.

The Annual Meeting of the Association will be held in the Ulster Minor Hall, Belfast, on Tuesday, Aug. 14, when, at 10.30 a.m., the chair will be taken by the President, Mr. W. Millar, Manager of the Cookstown Gas and Electric Light and Power Company, Ltd. Welcome by the Lord Mayor of Belfast, the Rt. Hon. Sir W. G. Turner, will be followed by the President's Address; and after the report of the Committee, with abstract of accounts and Auditor's report, and the election of District Representative on the Council of The Institution of Gas Engineers, there will be two papers: "Carbonization in Vertical Retorts," by Mr. James L. Hyslop, Diplomé of The Institution of Gas Engineers, Chief Assistant, Belfast Corporation Gas-Works; and one by Mr. W. H. Roberts, of the Donaghadee Gas Company, on gas *versus* electricity.

In the afternoon, a meeting of the Irish District Executive Board of the National Gas Council will take place under the chairmanship of Mr. J. D. Smith, M.Inst.C.E., Engineer and Manager of the Belfast Gas Department. Mr. E. J. Fottrell, Joint Manager of National Gas Council, and Mr. W. M. Mason, Manager of the British Commercial Gas Association, will review the work accomplished by the two bodies during the past year.

For Wednesday, Aug. 15, an excursion to Rostrevor and Newcastle has been arranged.

FORTHCOMING ENGAGEMENTS.

[*Secretaries of Gas and Kindred Organizations are asked to assist in making this diary of events as complete and useful as possible by sending the earliest intimation of all meetings.*]

Aug. 14-15.—IRISH ASSOCIATION OF GAS MANAGERS.—Annual conference in Belfast.

Sept. 5-7.—NORTH BRITISH ASSOCIATION OF GAS MANAGERS.—Annual general meeting in Edinburgh.

Oct. 22-24.—BRITISH COMMERCIAL GAS ASSOCIATION.—Annual Conference at York.

THE INSTITUTION OF GAS ENGINEERS.

All meetings take place in the Council Room at 28, Grosvenor Gardens, unless otherwise stated.

Sept. 10.—Emergency and Finance Committees and Benevolent Fund Committee of Management in the morning; Council meeting in the afternoon.

Oct. 8.—Emergency and Finance Committees in the morning; Council meeting in the afternoon.

Oct. 9.—Gas Education Committee.

Nov. 12.—Emergency and Finance Committees in the morning; Council meeting in the afternoon.

Nov. 13.—Executive Committee of Gas Education Committee.

Dec. 10.—Emergency and Finance Committees in the morning; Council meeting in the afternoon.

Dec. 11.—Executive Committee of Gas Education Committee.

The Institution of Gas Engineers' Transactions.—The Transactions of The Institution of Gas Engineers for 1926-27, during which year Mr. John Wilkinson, O.B.E., the Engineer and Manager of the Nottingham Corporation Gas Department, was in the chair, have just been published under the editorship of Mr. Walter T. Dunn, M.I.Mech.E., F.C.I.S., the Secretary to the Institution. It is a volume of nearly 700 pages, and as usual includes abstracts of papers relating to gas manufacture published in 1926-27, by Mr. A. V. Hendrickson.

PERSONAL.

Consequent upon the death of Sir Charles Jessel, Bart., Colonel H. LEROY-LEWIS, C.B., C.M.G., D.S.O., has been elected Chairman of the Imperial Continental Gas Association, and Sir HENRY BIRCHENOUGH, Bart, K.C.M.G., Deputy-Chairman. Colonel LeRoy-Lewis became a Director of the Association in November, 1903, and he was elected Deputy-Chairman in 1921. Sir Henry Birchenough joined the Board in November, 1899. Both gentlemen are well known in the City. Colonel LeRoy-Lewis is Chairman of the Continental Union Gas Company, and a Director of many other companies. Sir Henry Birchenough is President of the British South Africa Company, and also a Director of numerous other undertakings.

The current issue of the Co-Partnership Magazine of the Brighton and Hove General Gas Company, in mentioning the fact that Mr. G. Le B. DIAMOND, formerly Chief Engineering Assistant of the Brighton Company, has taken up his appointment as Assistant Engineer to the York Gas Company, states that he became a pupil of Mr. C. H. Rutter in 1920, and, after completing his articles, was appointed in February, 1922, as Chief Engineering Assistant. The record of his war services, which extended from 1914 to 1919, is a highly creditable one.

The Plymouth Corporation Gas Committee report having held a special meeting, at which the resignation of Mr. C. CARRINGTON BARBER, the Gas Engineer and Manager, was accepted, and Mr. FRANK BLACKBURN, Chief Assistant Engineer, was appointed Engineer and Manager on probation for three months.

Mr. S. G. HILL, B.Sc., A.R.C.S., has been appointed to the Gas Light and Coke Company's Gas Research Fellowship at the Imperial College of Science and Technology, for the year 1928-29, in succession to Mr. D. A. Winter, who has held the Fellowship for the past two years.

Mr. W. T. SLOPER has been appointed as representative of Lighting Trades, Ltd., in the South-West of England.

Colonel Sir EDWARD ALLEN BROTHERTON, Bart., D.L., LL.D., Chairman of Messrs. Brotherton & Co., Ltd., has been elected a Freeman of the City of Wakefield. The firm of Brotherton & Co., Ltd., was founded by Sir Edward at Wakefield just fifty years ago.

OBITUARY.

It is with regret that we have to chronicle the death, on July 21, of Mr. GEO. W. NORMAN, who for many years was an outstanding figure in Irish gas circles, and a burgess of the City of Dublin. A gentleman of kindly disposition, he endeared himself to all with whom he came in contact. His immediate business connection was with the Gas Meter Company, Ltd., Dublin. He was appointed Manager there in February, 1888, and held the position till the date of his death. It is worthy of note that for a considerable period they were the only firm who made gas meters in Ireland. For 34 years deceased was a member of the Irish Association of Gas Managers; and four years after he joined that body, he became Hon. Auditor—a position which he held until his death. Last year, during the annual proceedings of the Association at Cork, a trip was made to the world-famed Blarney Castle; and there, amid the historic ruins, Mr. Norman was presented by his colleagues with a tea service and silver salver, in recognition of the great services he had rendered to the Association during his membership. As the President (Mr. Joseph M'Nicholl, M.I.Chem.E.) truly said, when handing over the gift, he was a pillar of strength to the Association, and the token was small considering the yeoman services rendered by the recipient. On that occasion Mr. Geo. Airth, who has been Secretary and Treasurer of the Association for over twenty years, paid a high tribute to the work and worth of our late friend. That was Mr. Norman's last appearance in public. To Mrs. Norman and family we tender sincere sympathy.

The death occurred, on July 20, of Mr. EDWARD BOOTH, the representative in South Wales and the South-West of England of Lighting Trades, Ltd. Mr. Booth, who has been in the employ of the Ramie Company and Lighting Trades, Ltd., for a period of seventeen years, has been in failing health for some months; but the news of his death came with unexpected suddenness.

THE GAS INDUSTRY OF FRANCE.

51st Annual Meeting under the Presidency of M. Robert Ellissen.

In Paris, from June 12 to 16, there was held the 51st Congress of the French gas industry; and the occasion was a memorable one for several reasons. In the first place, it was the first annual meeting held under the ægis of the Union Syndicale de l'Industrie du Gaz en France, which came into being last year as the central organization to which are bound the Syndicat Professionel and the Association Technique, respectively the "N.G.C." and the "Institution" of our French confrères. Secondly, the attendance constituted a record; even more members making the journey than for the Centenary Congress in 1924, which remains such a pleasant memory for many gas men in this country. The technical reports and papers reached a high standard of utility and interest; and, finally, the social arrangements and visits left nothing to be desired.

It is our intention in this article to review briefly the proceedings as a whole, and elsewhere to reproduce or abstract a number of the papers. In doing so, we make acknowledgment to our esteemed contemporary, the "Journal des Usines à Gaz," whose special number, dated July 5, confers great credit upon M. H. Laurain (the Editor), M. P. Mougin, and the whole staff.

The session of the Union Syndicale was opened in the afternoon of June 12 by M. Ellissen, who was supported by M. Baril, Vice-President, and M. Rouland; and the first item was the welcoming of the representatives of foreign societies—notably, MM. de Brouwer, de Le Paulle, and Timmermans, of Belgium, Mr. A. F. P. Hayman, of The Institution of Gas Engineers, and MM. Gilliard, Keclik, and Rezola, respectively from Switzerland, Czecho-Slovakia, and Spain. These gentlemen having taken places on the platform, the President proceeded to review the activities of the Union since its formation.

PROPAGANDA.

Questions of propaganda and the education of the public are at the moment uppermost in the minds of the Committee. They seek to assure for the French gas industry a development analogous to what has been witnessed in certain other countries; and they feel that one essential to this end is to bring their publicity and propaganda work on to a scale commensurate with the industry's importance. It is not merely commercial publicity which they have in mind, but the desirability of enlightening the public as a whole—not forgetting local authorities—regarding the true nature, the national importance, and the possibilities of the industry. There is much ignorance to dissipate, and much prejudice to overcome.

POLITICAL STATUS OF THE INDUSTRY.

The second most important mission of the Union, said M. Ellissen, is the work of representing and defending the industry in its relations with higher authorities, who do not always maintain in right perspective the place of gas in the picture of political economy. Thus it came about that the Government recently promoted a Bill to set on foot a National Economic Council; and in neither of the two groups of industries from which it was proposed to call a representative did the gas industry figure. This omission brought from the Union to the President of the Council overtures and some enlightening statistics.

The gas industry in France gives employment to about 55,000 workers; the capital invested in it is not less than five thousand million francs; the annual sale of gas is more than 1½ thousand millions of cubic metres [52,950 million c.ft.]; and this involves a consumption of coal of over 5 million metric tons (4,921,000 tons). Thus the gas industry takes a leading place among those who provide tonnage for railroad, sea, and river traffic.

AN HONOUR FOR M. MOUGIN.

On the following morning began the sessions of the Association Technique, at which M. Baril, the President, took the chair; and among the early business, our own Institution was honoured by the election to honorary membership of the President, Mr. John Terrace. Then came the presentation of prizes for the best papers presented at the last meeting; and we are pleased to note that the most valuable, 3500 francs, was awarded to our good friend M. Pierre Mougin, the distinguished Secretary of the Association. His prize-winning paper dealt with "Modern Coke Quenching," and was translated at the time in the columns of the "JOURNAL." Other awards were granted to M. Hubert-Desprez and M. Forrières.

Thereafter the technical programme commenced with the Presidential Address of M. Baril, whose subject was the cracking of gas oil.

INAUGURATION OF THE TONBRIDGE TAR WORKS.

South-Eastern Co-operative Tar Scheme.

Last Wednesday saw the official opening of the Tonbridge Works of the South-Eastern Tar Distillers, Ltd.—a co-operative scheme which commenced operations in January of this year and which is destined to be of great benefit not only to the individual gas undertakings who have joined with such enthusiasm, but also to the gas industry generally, by improving the status of gas tar and enhancing its popularity among surveyors. Never before has more interest been taken in the question of road surfacing than is the case at the present time. With the ever-increasing volume of traffic, road slipperiness is becoming each day a greater danger; and there is obvious need for the surveyor to employ materials in the construction and surfacing of his roads which will obviate this danger. Tar, as all in the gas industry realize, is the material to do this; but it must be tar of definite and—even more important—constant properties. The aim of the South-Eastern Tar Distillers, Ltd., is to ensure that gas undertakings shall find a lucrative outlet for one of their valuable bye-products, and that the surveyors of the area shall be equally sure of obtaining a product which will satisfy all their needs far more cheaply and efficiently than imported material from foreign sources. It is significant that since the co-operative scheme came into existence, the demand for tar on the part of surveyors in the area—and, it must be mentioned, their satisfaction with the constant quality supplied—have grown in no small measure.

The South-Eastern Tar Distillers, Ltd., has a Board of Directors composed as follows: Lieut.-Col. O. E. Boulton (Chairman); Messrs. Hubert Fergusson, Walter C. Forbes, J. Reginald Lane, Josiah B. Lane, Arthur Valon, W. M. Valon, and Major A. G. Saunders. Mr. W. M. Valon is the General Manager.

The first gas representatives of the Management Committee are: Messrs. J. Donaldson (Chairman), J. M. Campbell (Vice-Chairman), F. J. Ball, W. H. Bennett, D. H. Davies, L. G. Humphrys, L. J. Langford, J. J. Paterson, R. H. Ruthven, and J. Urquhart.

The Inauguration Ceremony.

On Wednesday last, in the absence of the Chairman of South-Eastern Tar Distillers, Ltd. (Lieut.-Colonel O. E. Boulton), Mr. J. Reginald Lane asked Mrs. J. M. Campbell to declare the works open. In doing so, he mentioned that the original intention was that Mrs. J. Donaldson should perform the ceremony, but unfortunately Mr. Donaldson, who is the Engineer, Manager, and Secretary of the Tonbridge Gas Company, was unable to be present.

Mrs. J. M. Campbell then declared the works open, and wished the Company every success. Thereafter, under the guidance of Mr. W. M. Valon, those present, who included most of the Engineers of the undertakings participating in the scheme, commenced a tour of inspection of a plant which must be a model.

Description of the Plant.

Under the supervision of Mr. W. Forbes, who is the Works Manager of Messrs. Burt, Boulton, & Haywood, Ltd., the plant has been laid out in an extremely efficient manner which allows of extension at any time. As it stands to-day, the plant is capable of treating 80 tons of crude tar per day, and producing tars to Road Board or any other specification. The crude supplies are brought by road in Foden tanks of a capacity of 2300 gallons. This tar is emptied into a sump, and is thence pumped into a 2000-ton storage tank which acts as a feeder to the plant. The tar from this tank flows through a preheating system which eliminates part of the water content and a portion of the naphtha constituents. From the preheater it is led either direct into the still, or via a heat exchanger of novel design consisting of a series of very carefully assembled tubes. The stills themselves are of standard design, direct fired, and the condensers, fractionaters, and receiving tanks for light oils and creosote call for no special comment. A noteworthy feature of the plant is that not only is the crude tar blended to ensure as far as possible a uniform quality in the refined tar, but the refined tar itself is also blended in a mechanical mixer, so that surveyors will at all times receive a correct and satisfactory material. The refined tar is pumped to boilers or into closed tanks, of which latter there are two, each of a capacity of 500 tons. These tanks are fitted with a most interesting local heating system which warms-up 2000 gallons of tar at a time, when required, and thus conserves heat. The normal practice, of course, is to heat-up the whole storage tank by steam coils. If this method were employed in a 500-ton tank, it would be about 48 hours before the tar would be ready for loading. With the local heating system, however, 2000 gallons are heated to the required temperature in twenty minutes. As fast as the tar is withdrawn from the intensive heated portion, fresh tar takes its place. A further point of great interest is that all tanks, receivers, &c., are totally surrounded by waterproof retaining walls, so that, if leakage should by any chance occur, no tar or other product would be lost. Every provision has been made to obviate loss, and equal attention has been paid to such points as the lagging of pipes, &c. Altogether the plant is well arranged; and those responsible well merited the appreciative comments which were passed upon it by the visitors on July 25.

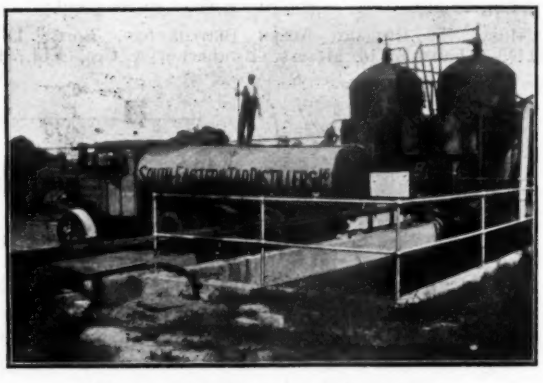
Luncheon.

Following the inspection of the plant, the visitors were the guests at luncheon, which was held at the Rose and Crown Hotel, Tonbridge, of the Chairman and Directors of the South-Eastern Tar Distillers, Ltd. Mr. J. M. Campbell, the Engineer and Manager of the Isle of Thanet Gas Light and Coke Company, occupied the chair. After the Loyal Toast had been honoured,

Presentation to Mrs. J. M. Campbell.

Mr. J. Reginald Lane said that, on behalf of the Tar Distillers, he had a very pleasant duty to perform—that of asking Mrs. Campbell to accept a solid silver dish, as a memento of the occasion. [A similar dish was sent to Mrs. J. Donaldson.]

Following Mrs. Campbell's expression of thanks, the Chairman, having read a telegram of good wishes from



Unloading Crude Tar at the Tonbridge Works.

Lieut.-Col. Boulton, explained that he (Mr. Campbell) was acting as deputy for Mr. Donaldson. All present, he was sure, greatly regretted Mr. Donaldson's unavoidable absence. Continuing, Mr. Campbell observed that they were very delighted with the progress of the South-Eastern Tar Distillers, Ltd., since the scheme came into existence. Much of this progress was the result of the work of Mr. Forbes and Mr. W. M. Valon. The Committee which had been formed to co-operate in the work were anxious to get the whole of the gas undertakings in the south-eastern area to join what was unquestionably an excellent scheme which would be a boon to surveyors. He had great pleasure in submitting the toast of "The South-Eastern Co-Operative Tar Scheme," coupled with the name of Mr. J. R. Lane.

Mr. J. R. Lane briefly replied.

The toast of "The Visitors" was given by Major A. G. Saunders, and was responded to by Mr. W. H. Hammond, Engineer and Works Manager of the Eastbourne Gas Company, and Mrs. J. R. Lane. The former remarked upon the ideal situation of the works, and said that he was in complete sympathy with the co-operative scheme, for it was conducive to economy. He wished the venture every success, and hoped that all undertakings which at present were not participating in the scheme would eventually join it. He congratulated those responsible for the design of the works.

The toast of Mr. and Mrs. W. M. Valon, and of the staff, was then proposed; and Mr. Valon, in a brief reply, explained that the area which the scheme covered, or proposed to cover, was the whole of the south-eastern district from a boundary drawn from Gravesend to Guildford and from Guildford to Bognor; and there was no question that, if they enjoyed the support of all gas undertakings in that area, the scheme would be very successful.

A vote of thanks to Mr. Campbell for occupying the chair brought the proceedings to a close.

NEW RESEARCH LABORATORIES AT FULHAM.

GAS LIGHT AND COKE COMPANY'S MAGNIFICENT INSTALLATION.

All who were privileged to be present (and the gathering was a large one, which included many prominent scientists) at the official opening last Thursday by the Chairman of the Fuel Research Board, Sir Richard Threlfall, G.B.E., F.R.S., of the new Research Laboratories at the Fulham Works of the Gas Light and Coke Company, were filled with admiration of the completeness of the arrangements and the generous—even magnificent—scale on which everything has been planned. The opening was preceded by a luncheon in the chief offices of the Company at Horseferry Road, at which Sir DAVID MILNE-WATSON, D.L. (the Governor), presided, and was supported by his colleagues on the Board. At the Governor's left hand sat Alderman W. J. Waldron, the Mayor of Fulham.

SPEECHES AT THE LUNCHEON.

After the Loyal Toast had been honoured,

THE CHAIRMAN.

Sir DAVID MILNE-WATSON, on behalf of the Directors, welcomed the guests, and said it had been arranged that the speeches should be delivered before going to Fulham, and that the ceremony at the new laboratory would consist of the formal opening of the door by Sir Richard Threlfall. He then proceeded: It is not my intention to deliver a long speech to you this afternoon, because we have here Sir Richard Threlfall, the Chairman of the Fuel Research Board, who has kindly offered to open our new laboratory. Sir Richard Threlfall's name is a household word, I am sure, to all who are in this room; and we give him a warm welcome, and are very glad indeed to have him with us. On behalf of my fellow Directors, we thank him heartily for having taken the trouble to come all the way from Birmingham at this time of the year to perform the ceremony at Fulham. We are also glad to see here to-day his Worship the Mayor of Fulham, in whose borough the laboratory is situated. Fulham is, indeed, a happy borough, inasmuch as it has not only the Gas Light and Coke Company's great works there, but it has a power station at Lot's Road, and now it is going to have (under the auspices of my friend Mr. Frank Hodges) a super-station for the production of electricity. The Borough of Fulham has always been kind to us. It has its own electricity works; but there has never been any real jealousy between us. We go our own road, and both contribute to the well-being of London by trying to make it as smokeless as possible. Among the other guests, we have many representatives of the chemical industry, whom we are pleased to see in our midst. We have also representatives of the National Gas Council and The Institution of Gas Engineers, and also some of my colleagues on the National Fuel and Power Committee recently set up by the Government.

AN OLD INDUSTRY WITH NEW PROBLEMS.

The place where we are gathered together—Horseferry Road—is the *locus classicus* in the gas industry of this country. As I daresay most of you know, it was here that the first gas-works were erected in 1812—116 years ago—and though we have given up the manufacture of gas here, we still store it in large quantities on this site—the first site on which gas was made in London, and where the world-wide industry of gas manufacture was started. There are very many interesting problems to be solved in the gas industry to-day. As most of you are aware, the industry has been founded on what is known as high-temperature carbonization, and we conduct our business on these lines; but there are new processes and new ideas springing up in other directions. There is low-temperature carbonization, which has great problems connected with it; and at the same time there are many problems to be solved with regard to high-temperature carbonization. The new laboratory at Fulham is intended as a focus for the Company's research work on these problems. The laboratory is commodious, and is fitted up with all the latest appliances and apparatus for research work; and it has been designed by my friend Mr. W. Tapper, who is President of the Royal Institute of British Architects. The research staff there will be free from ordinary gas-works testing; but as the laboratory is situated on a gas-works, they will have the advantage of being in touch from

THE NEW LABORATORIES.

day to day with the working conditions under which gas is made. I think that is a very important part of our scheme. They will not only have gas questions, but they will have coke questions and tar questions to investigate. Very little is known about low-temperature carbonization tar; and that is one of the problems which we have set out to solve. It will be at Fulham that the tars which are produced at Richmond (where we are experimenting at the present moment with low-temperature plant at the request of the Government) will be tested. We all of us look forward with the greatest interest to seeing what results will be obtained from low-temperature carbonization on the scale on which we are doing it.

Sir Richard Threlfall's Address.

Sir Richard Threlfall, having been called upon by the Chairman, said he felt highly honoured at being asked to address those present, and to perform the formal opening ceremony. In the course of his remarks, he said:

One of the things which strike a chemist or physicist when approaching the biological sciences, is the narrow range of temperature within which alone the phenomena of life occur. A chemist's attention might also be drawn to the fact that his medical adviser has to carry a thermometer graduated to fiftieths of a Fahrenheit degree, with a range of (say) 10°, in order to investigate the state of health of his patients, whether he practises in Greenland or Ceylon, and only requires one thermometer wherever he is. Human beings can, and do, exist over a range of external temperature of more than 100° Fahr.—that is to say, over a range of (say) 100 times the roughly permissible body temperature variation. How is this possible? It is only possible because man himself has invented means of narrowing the range so as to get within the limits of his own temperature regulation—in other words, he has invented fire, clothing, and housing. Moreover, human beings require food, and they can find it in some form, directly or indirectly, wherever the sun shines—but not always in a form in which they can assimilate it, so that in effect the supply is limited, and competition for it ensues. This has most probably led to human creatures occupying areas where food is available, though climatic conditions are very unfavourable. It is at least a plausible view that man's struggle with nature is due to his being driven or tempted to follow the food supply, and by intelligence leading to invention has devised means of overcoming climatic difficulties, particularly in the supply of heat to his body and its conservation therein. The aspect of the matter which interests us this afternoon is the supply of heat by oxidation of carbon and hydrogen in the neighbourhood of the body—not within it—together with the supply of light by which mankind's working life is increased.

Inventions such as the use of fire were made before records were kept; but we have copious records of later inventions, and very likely the earlier ones came about in a fundamentally similar way, as assumed and put forward by Charles Lamb in his "Dissertation upon Roast Pig." First comes the chance observation by an individual gifted enough to seek for its implications; then the attempt to reproduce the phenomena by copying the original apparatus; then the attempt to distinguish essential from unessential parts of the process, leading to a working theory, and finally the improvement and simplification of the operation under guidance of the theory, which itself is subject to continual extension and improvement. These remarks apply to a fundamental invention—not to inventions of improvements which rest on the successive observations and thought of many individuals. I cannot think of any discovery made in my time that does not rest to a greater or less extent on previous work. Perhaps Röntgen's observation of a new kind of radiation, Thomson's discovery of the electron, the Curies' radium, Rutherford and Soddy's unravelling of radioactivity, and Einstein's improved method of regarding mechanical phenomena owe least to their predecessors' labours. Both academic and technical progress has been made throughout the ages, and, indeed, till within the last twenty years or so, by the efforts of individuals who are usually engaged in, and were paid for, quite other matters than the making of discoveries. I remember the time—not so very long ago—when research was looked upon by the majority of quite educated people as a sort of hobby to be indulged in by those whose means permitted them sufficient leisure. So far as I know, the Royal Institution was one of the first places where physical and chemical research was looked upon as the primary duty of the Professor, though, of course, the endowment of learning—*i.e.*, the careful investigation of what much earlier people had written or said—is a very old idea.

Looking back over the history of civilization, it seems amazing that so much thought and time should have been spent over the study of the opinions of people whose sources of information were so meagre, while the whole vast subject of the study of the phenomena of the habitable world was left severely alone. No doubt an explanation can be thought of; but the history serves as a warning of how difficult it is to overthrow a false standard of intellectual activity after it has once become established, and particularly after it has attained the dignity of being a "vested interest."

History of Carbonizing Coal.

Let us turn to the history of our own art—that of carbonizing coal. Passing over previous attempts, I would draw attention to the fact that Boulton and Watt's factory near Birmingham was illuminated by gas—presumably as a demonstration—by Murdoch at the celebration for the Peace of Amiens in 1802. In Thorpe's "Dictionary of Applied Chemistry," 117 years later, Dr. Harold G. Colman, a recognized authority, writes as follows: "Up to within the last few years the method of manufacture of coal gas has remained in its general principles almost identical with that employed by Murdoch and his immediate successors (prominent among the latter being Samuel Clegg senior, and his son Samuel Clegg junior), although in detail and in the magnitude of the operations great change has taken place."

What is to be inferred from this story? Is it that Murdoch and the Cleggs were people of such divine genius that their technical work could not be bettered—or is it that those who directed the commercial side of gas undertakings took the limited but sensible view that they had a sufficiently good process to be remunerative as it stood—why, therefore, should they trouble about, and spend money upon, improvements? If this view is not correct in so far as it refers to the Directors of Gas Companies in this country—and I have no information on the point—I can say quite definitely that it is true of many other industries, for I have met it personally often enough. One wonders if Mr. Henry Ford acted on any such views in regard to our old friend the "Tin Lizzie." It is possible he did, for they are common enough.

In regard to the gas industry in America, I came across an address by Mr. F. W. Seymour, Vice-President of the Battle Creek (Michigan) Company, in which he said, in September, 1922: "There seems inherent in our industry an unholy fear of trying-out something new, as the path of the pioneer is frequently not a pleasant one." I wonder if this could by any possibility apply to British enterprises.

It seems only fair, however, to say that, as regards the early gas companies, they were kept busy for many a year in competing with each other, in extending their distribution system, in a perpetual struggle with municipal authorities and even with Parliamentary Committees, and had not any great margin of funds at their disposal. Moreover, their technical personnel was not in general of the highly educated speculative inventive class. For the latter remark, I am indebted to the late Mr. (later Sir) Corbet Woodall, as far back as March, 1898, when he was good enough to arrange a visit to Beckton for me—the first gas-works I ever visited.

"Working for the Future."

Be the reason what it may, the fact remains that during the prosperous days of the nineteenth century the gas industry, like many others, did not devote much time or money to "work for the future"—the term by which a Chairman of the old Edison Company in the United States denoted research. Meanwhile—I need not repeat the well-worn tale—Germany had fought its way into competing with England's foreign trade by proceeding in what they would call a "rational" manner, financially, commercially, and technically; and especially by "working for the future" they improved the present in all directions. During the war this process, long appreciated by the few, penetrated even into political circles; and there was some searching of heart as to why industry in this country had not also "worked for the future." In view of the fact that several millions a day were being spent on the war, those in authority decided that some moderate sum might be spent in an endeavour to put the position of research in scientific, and particularly technical, matters on a better basis. After a time, during which the ground was surveyed, the policy settled down to creating institutions devoted to the study of matters supposed to be beyond the scope of individual effort, and encouraging the members of various industries to combine for research purposes; a sum of £1,000,000 being devoted to the assistance of the latter. The new venture, born in the Education Department, was placed under the Lord President of the Council for administrative purposes, with Sir William McCormick as Executive Chairman, Sir Frank Heath as Secretary, and an Advisory Council of scientific men and industrialists. As one who has had a continuous, but small, part in its development, I may say that, subject to the strict but sympathetic attitude of the Treasury, its own frugality, and the interest shown in it by successive Lord Presidents, whatsoever success the Department may have attained has been mainly due to the wisdom and work of the Chairman and Secretary.

Department of Scientific and Industrial Research.

The activities of the Department of Scientific and Industrial Research are, of course, adequately described in the annual reports; but there are one or two points to which I might refer. In the first place, the guiding principle has always been rather to induce the industries to do things for themselves than to attempt to do scientific work for them. The idea was that if only those who conduct manufacturing operations could be brought to value doing work for the future by investigation, they would willingly continue such work with-

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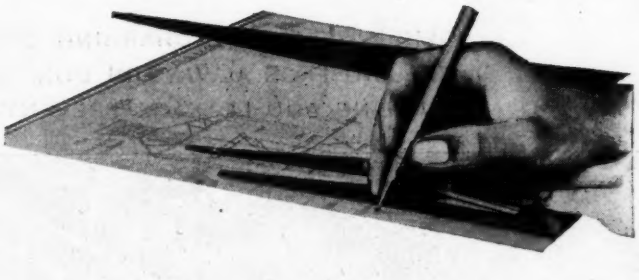

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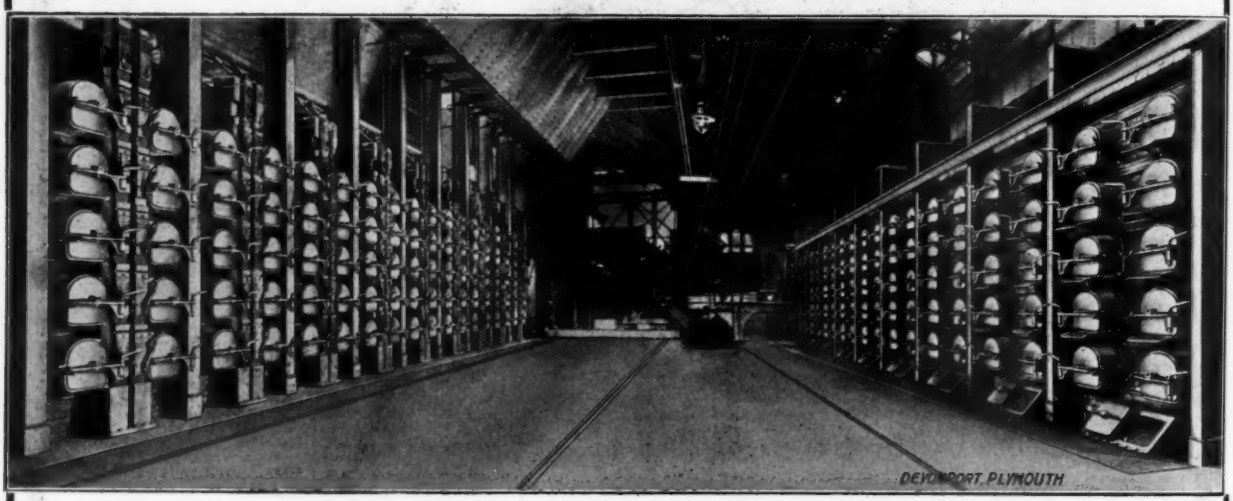

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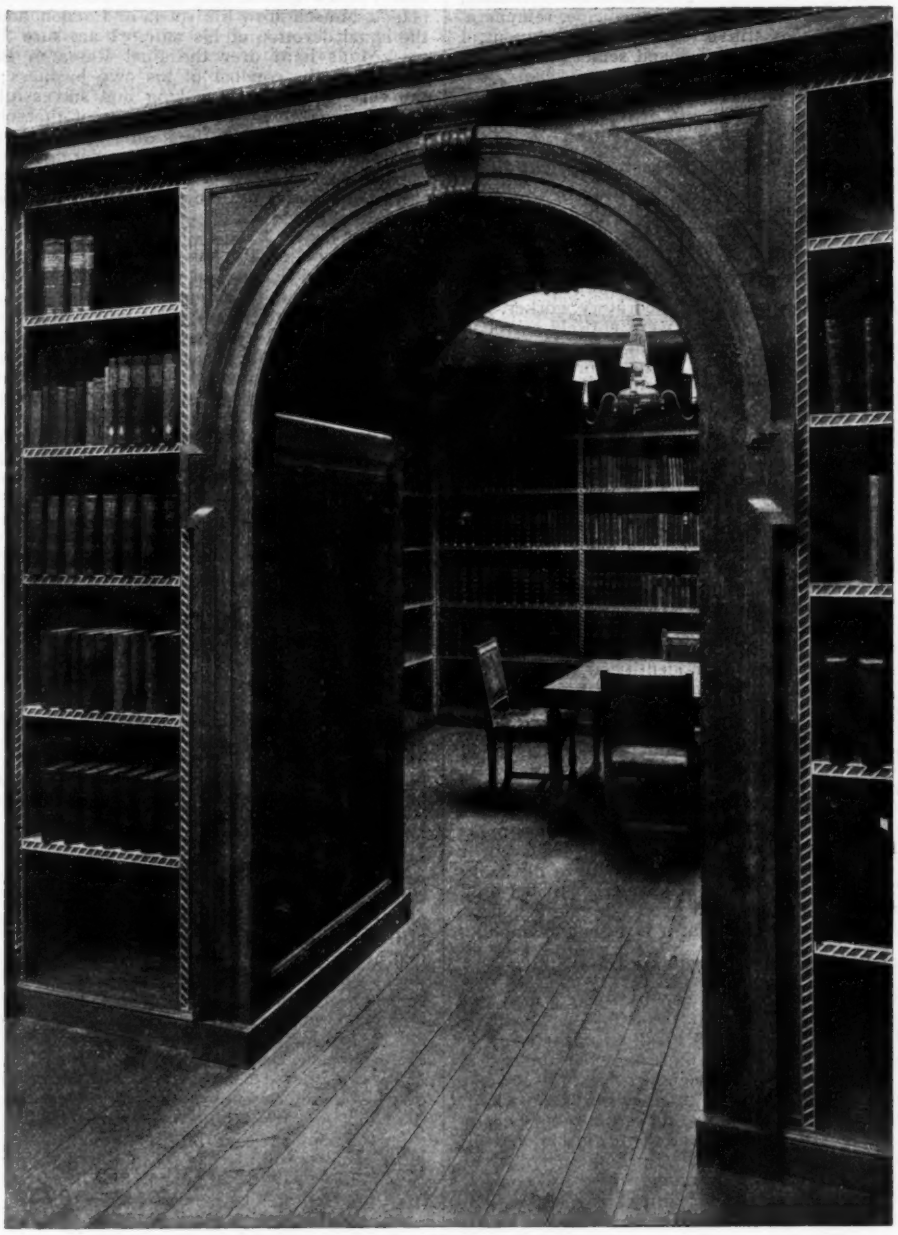

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out external pressure. The difficulty would lie in creating initially a receptive state of mind—a difficulty so great that it could only be overcome by actual demonstration. From this it was hoped there would arise in time such a body of enlightened opinion that nobody would dream of conducting a manufacture without the assistance of systematic research. There is hardly any industrial operation, perhaps no such operation at all, which would not benefit if it were systematically investigated. For instance, to take the gas industry, which has been in existence now for something like a century and a quarter, one of the surprises of my life was to find that it was the opinion of the leaders of the technical side of the industry that research was required into the working of ordinary horizontal gas retorts; and I noticed some two years ago that the Chairman of the Imperial Chemical Industries stated, in his annual address, that research was still needed in relation to the ammonia-soda process. The missionary aspect of the Department's work has borne fruit in many directions; but having regard to the ability with which the affairs of the Gas Light and Coke Company have always been conducted, I should hesitate in describing the establishment of the laboratories we are visiting to-day in any way as due to the example set by the Department.

Another matter which was forced upon the Department's attention at a very early date was the difficulty of finding properly equipped young men to carry on the investigations it was proposed to set going. It always used to be said that the rapid progress made in the dye industry in Germany was largely due to the fact that their system of education produced many more young men capable of scientific employment than were available in England. Very likely there is some truth in this. At all events, when the Department began to seek for workers, it was faced with a very great difficulty in finding them. Accordingly, and with the consent of the Board of Education, a system was instituted by which promising young graduates were assisted to continue their training for two or three years, during which time they underwent a sort of apprenticeship in research work under their own teachers. Enormous care was exercised, both in the selection of the candidates and in watching their careers; as much as £50,000 a year being spent on this activity at one time. The results, I may say, have on the whole been entirely satisfactory; but I have always felt that the pursuit of science, either pure or applied, could not become a reasonable profession until a sufficient number of fairly good openings was assured. In the course of my life—particularly as a fisherman—I have noticed what great observational powers are possessed by many people who would not describe themselves as in the least scientific; and I have gradually come to the conclusion that there is plenty of raw material among the young men and women of this country which only needs reasonable encouragement to form the personnel of a large research army. In short, the parents of this country must be assured that science as a profession is worth following from the financial point of view, before their sons and daughters will be allowed to embrace a scientific career. I fear that this will mean that for one or two generations, at all events, the scientific posts will have to be overpaid. In course of time, when once the scientific career

is established as holding out offers of reasonable remuneration, comparable with those held out by law and medicine, remuneration will reach a proper competitive level. At the moment, I should say that beginners are overpaid, and seniors are underpaid.

Importance of Personnel.

In establishing new laboratories there are two things to be considered—equipment and personnel. Of these incomparably the more important is personnel; for the best equipment differs from the worst only in saving time for those who are using it. During recent visits to America, I have taken the opportunity of conferring with the heads of many large industrial laboratories in that country, with a view to ascertaining the lines on which such laboratories are best conducted. I may say that I had very decided views of my own on the subject after spending something over half-a-century as a laboratory worker, and I was pleased to find that these views were entirely corroborated. In a word, it amounts to this—that everything turns on the personality of those at the head of the laboratory. That is to say, it depends on qualities with which the Chief was endowed by nature, and not upon the knowledge he may have acquired. Of these qualities, enthusiasm for the work is the most important. Service should be looked at before remuneration. There should be personal contact between the director and the worker; and I personally, if forced to choose, would select an enthusiastic director rather than a distinguished exponent of the science he professes. I have heard a good deal about team work of late years; but I have never understood exactly in detail what this term is held to mean. Of course, a large number of people may be employed to study different aspects of any particular phenomenon. Does team work mean that they are to exchange their ideas freely? If so, it can do nothing but good. On the other hand, does it mean that workers are expected to conceal their identity in the presentation of results? If so, I think that one great incentive to every worker is withdrawn. I propose, as a more effective alternative to the elimination of the man whose attitude is "I said it first," that all workers should make it a point of honour—and I speak to senior workers more particularly—to make a habit of giving, if anything, more credit rather than less to those who work under or with them, for any advance that may be made by their conjoint efforts. I remember many years ago that I was greatly struck by the care displayed by Charles Darwin in expressing his obligation, both in his books and in his letters, to those who had in any way assisted him. I thought at the time this would be a good example to follow, and can now state from experience that it is a good example.

Facilities Now and Fifty Years Ago.

I cannot help contrasting the facilities which young men now enjoy in the pursuit of science with those in existence fifty years ago. I suppose that I had as good an opportunity as anyone, but nevertheless I remember the time when the cost of a test-tube was a serious item in a budget consisting of 6d. a week pocket money, and when a test-tube brush was a wholly unnecessary luxury, seeing that the same result could be produced by a large feather. The need for thrift did undoubtedly engender, in many cases, some aptitude for making shift with whatever was at hand, and led to young people constructing their own apparatus to an extent undreamt of nowadays. No doubt in many cases time was wasted, at all events as judged by the examination standard; but I am very sure that there was some corresponding advantage to off-set it. It is clear that the happy mean lies in providing young workers with whatever help machine tools can give. For instance, what earthly use is it to anyone to use a blunt hand saw when the work can be better and more quickly done by a machine saw, or to use a hammer and file instead of a small milling machine? I noticed in America that in some physical laboratories there was in every room a small milling machine and lathe permanently set up at the end of the bench on which physical apparatus was being employed. I do not mean that investigators should have to do physically exhausting work. Indeed, the time is coming when human beings will not be expected to usurp the functions of a generator of power; when human activity will be restricted to directing the operations of mechanism. This is one of the vistas which are opened-up by the provision of a cheap and reliable service of electric power.

It is historically true that every prophet and apostle of a great cause has to suffer considerable self-sacrifice. When the Department of Scientific and Industrial Research set out to attempt to create a change of opinion—and such a change—in a country like Great Britain, the home of individualism in enterprise, they faced a mighty task. It is true that the country was ripe for such an effort, and I think it is also true that there are signs that the effort is successful; but, like every such effort, self-sacrifice has had to be shown by the prophets.

The Late Sir George Beilby.

I should be sorry to conclude this address without referring to my old friend Sir George Beilby, and his efforts in thinking out and establishing the Fuel Research Board. As an old man, at the end of a laborious life, sufficiently endowed with this world's goods, he forsook his home in Glasgow, and betook himself to a life spent in London hotels, supported by the equal devotion of his wife. I am sure that he must have worked as hard over the Fuel Research Board as he ever worked in the conduct of his own business; and he brought the vast experience of a long and successful commercial and engineering life to the attainment of that object—and all entirely gratuitously. I think that Beilby deserves to be commemorated as the protagonist of general research in the domain of fuel. I can think of no better example for the workers in these laboratories to follow than that of Sir George Beilby.

Fulham's Acknowledgment.

The Mayor of Fulham: On behalf of Fulham, I desire to say that we welcome and wish to encourage the Gas Company in this further improvement of their great works in our borough. Several of my most interesting functions have been connected with the work of the Gas Company. Two or three years ago I had the pleasure of being present at the inauguration of the excellent coal handling plant at the Fulham Gas-Works, which has done so much to enable the work there to be carried on expeditiously. I also had the felicity of being invited to open the new showrooms in Fulham which were inaugurated about twelve or fifteen months ago; and to-day I have the further felicity of being present at this important function. The developments at Fulham Works indicate that the Company are quite alive to the march of progress in the gas industry, and are also a recognition of the strategic position which Fulham holds among the boroughs of London. I believe the Fulham Gas-Works is one of the oldest in the country; and it is in the position of serving a great many of the boroughs and the big populations in the immediate district. Sir David has told you that it has been decided to make Fulham one of the great distributing stations for electricity in the country. We in Fulham are undertaking this great work; and my friend Mr. Frank Hodges has told me that Fulham eventually will be the part of London in which the "battle of giants" will take place—that is, the battle between electricity and gas. As a large owner of property, I want to say there is plenty of room for both to go forward in the service of the public—in the service of the community. The two great principles that have made the Gas Company such an important undertaking as it is to-day have been that the Directors have recognized that the work they have to do first of all is to serve the public; and, secondly, they have by their co-partnership scheme endeavoured to create a feeling among their employees that is so much to the advantage of the carrying-on of their great work. If I may speak of one little secret, I was told by a prominent member of the Cabinet to-day that during the big strike that took place a year to two ago the Government recognized, though the community did not quite recognize, the important service that the Gas Light and Coke Company did for the country during those critical days. As the result of the enlightened administration of the Company, there is no doubt that they can be justifiably proud of the enormous work they do in the area they serve. It is a proud thing to know that they serve no less than 1,250,000 consumers. If you consider the population of the area which the Company serve, this must mean that almost every householder is a customer. That is a wonderful performance to their credit; and to-day we are here to celebrate another great development in the policy of service to the public—the installing of this research department in the Borough of Fulham. This will enable the Company to find out in what further way they can serve the public by the development of science in connection with the bye-products which they create. Not the least of these bye-products is the tar which has given us such splendid roads throughout the whole of the country. I for one to-day wish to offer congratulations to Sir David and his Directors on the progressive methods they employ in the gas industry in London. [Applause.] We in the Capital have much to be thankful for in the work that they do for us, and the comfort they allow us to enjoy in our homes to-day—a comfort that a generation ago those who lived then did not enjoy. On behalf of the Borough of Fulham, I want to thank you most sincerely for your hospitality to-day, to wish you all prosperity in your undertaking, and to express the hope that you will go on developing your work in Fulham. You may rely upon it that we will give you all the encouragement and assistance we can.

Opening Ceremony.

The Company were then driven to the new laboratory; and on arriving there, Sir Richard Threlfall inserted a key in the main entrance, and, opening the door, said: I have great pleasure in opening the door of this laboratory. May it do all, and more than all, that I think a laboratory ought to do.

THE LABORATORIES.

The new laboratories have been erected to permit an extension of the research in connection with the manufacture of gas which has been proceeding at each of the Company's thirteen gas manufacturing stations and in smaller laboratories at Westminster and Tudor Street. In connection with the opening ceremony, a brochure containing much interesting information was prepared; and from this the following particu-

lars regarding the operations and policy of the Company and details relating to the new laboratories have been taken. We are also indebted to the Company for the use of the photographic illustrations which were included in the brochure.

SCOPE OF WORK.

Although high-temperature carbonization has now been practised for so many years, the various processes of manufacture and purification are still capable of improvement; and there are many reactions involved in high-temperature carbonization of whose mechanism our knowledge is not sufficiently exact. It is to the investigation of these that the research work in the new laboratories will be primarily directed, as also to study of the structure and composition of the coke, tars, and other residuals which may enable the processes of manufacture to be so modified as to produce more suitable qualities of these residuals. At the same time there is much of interest in the development of the various processes of low-temperature carbonization; and, in particular, much work remains to be done in connection with the tars and semi-cokes produced by these processes. The staff at Fulham will also be closely connected with the results obtained from, and the experiments conducted in, the plant now being erected at Richmond as a result of discussions with the Government, the Department of Scientific and Industrial Research, and others, and the two other smaller units of low-temperature plant which have been erected by the Company.

EXPERIMENTAL CARBONIZING PLANT.

There are many problems which can only be satisfactorily investigated on the full works scale; and the study of the chemical reactions likely to affect the design or method of working of the various types of high-temperature carbonization plant will be greatly facilitated by the experimental carbonizing plant at Fulham, which will permit of quantitative work being carried out under normal working conditions.

This plant consists of a train of condensers, washers, and purifiers leading to a common inlet to a pair of gas meters. The meters are geared together in such a manner that a definite small proportion of the gas is passed through one meter into an independent holder. The remaining gas is passed through the other meter into one of the works mains. A special governor maintains equality of pressure in the two meter outlets, and thereby secures accuracy of measurement. The meters are fitted with a recording speedometer, whereby a graph showing the rate of gas evolution at any moment is obtained for comparison with the chart from a recording calorimeter installed nearby. In the meter house a bench is provided for making such chemical and physical tests of the gas collected in the holder as may not be more conveniently performed in the laboratory. Tanks are provided in a covered basement for the collection, separation, measurement, and sampling of tar and liquor from the various sections of the plant.

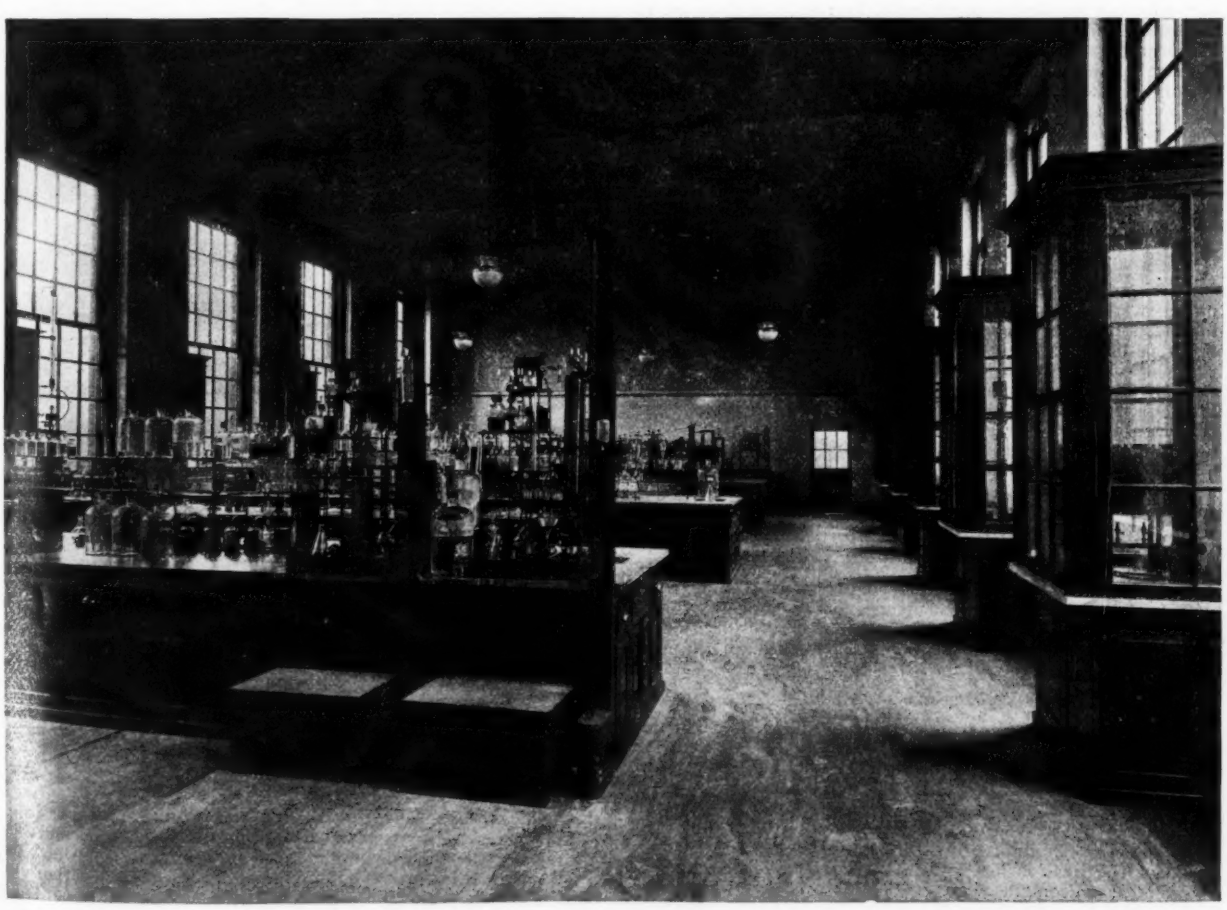
To this plant there may be conducted either the whole of the gas made in one or two horizontal retorts of full working size contained in an independent setting, and provided with a separate coal charging machine and weighing machine, or the whole of the gas made in one vertical retort contained in an adjacent setting of modern design, and provided with an independent coal hopper and weighing machine. Similar arrangements will be made in connection with one of the new vertical retorts of different design now being erected in another adjacent retort house. Gas from a unit of low-temperature carbonizing plant may also be examined when desired. In connection with the horizontal retort setting of this plant, useful results are already being obtained regarding the relationship between the yield of gas and pressure conditions within the retort during carbonization.

Space has been reserved near the plant for the installation of a small briquetting plant, in order that a quantitative study of the influence of blending and briquetting coals prior to carbonization may be made on this plant.

CARBONIZATION OF COAL.

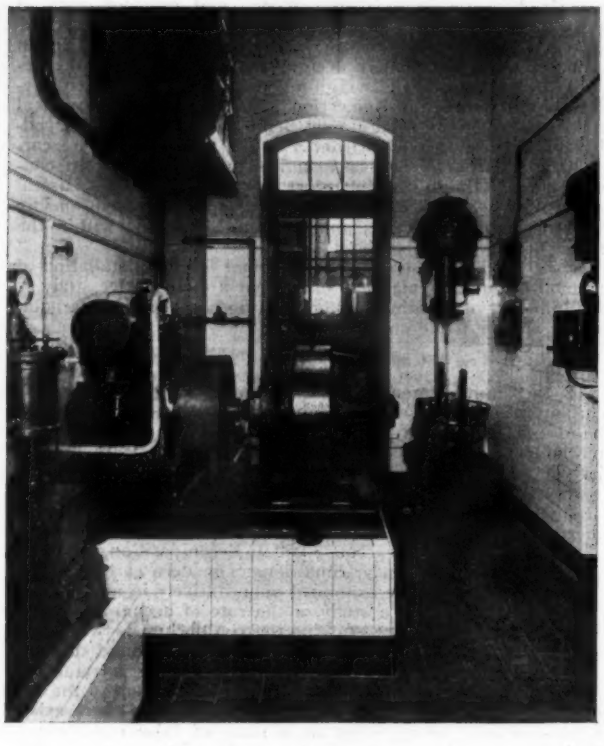
Further improvements in connection with high-temperature carbonization processes are, as has been suggested, frequently hampered by lack of fundamental knowledge regarding the mechanism of the chemical reactions involved. With the object of acquiring this knowledge, the Company began a few years ago to study the thermal decomposition of hydrocarbons. Methane is the most important constituent of coal gas from a thermal point of view, and chemically it is one of the simplest and most stable hydrocarbons; yet its decomposition, which is known to take place under conditions of modern carbonization, has not been previously examined quantitatively in any detail.

As a preliminary to a study of the rate of decomposition, it has been necessary to re-examine the equilibrium between carbon, hydrogen, and methane, since it has been found that the hydrogen produced by the decomposition exerts a retarding effect, depending mainly upon the nature and extent of the hot surface to which the gases are exposed; and that there exists what can only be regarded as a state of false equilibrium. This effect is of both academic and practical importance in view of its bearing upon the study of other hydrocarbons, and in



NO. 1 LABORATORY.

view of the special protective influence of hydrogen upon methane under conditions which exist in gas retorts. It has been shown that the quantity of methane in the gas evolved during the later stages of carbonization is governed, not by the true equilibrium, but by the false equilibrium. It has been found also that when methane is heated without intimate contact with hot surfaces—for example, by radiation from an incandescent filament—appreciable quantities of unsaturated hydrocarbons, naphthalene, and heavy oils may be produced. A more detailed study of this aspect may be of practical importance in other industries. The Company's interest lies particularly in the prevention of the decomposition of methane, for which it is necessary to have a detailed knowledge of the chemical reactions involved.



Compressor Room.

In the near future it is proposed to extend this work to a study of other hydrocarbons of a more complex nature, so that ultimately the decomposition of primary tars may be studied in much greater detail than has been attempted hitherto.

Large-Scale Investigations.

During recent years the gas manufacturing plant at several of the works has been utilized by the research staff for the investigation of a variety of problems; and it is intended that this type of large-scale work shall continue in close collaboration with work carried out on a smaller scale, but with greater refinement, in either the experimental plant or the research laboratory. As an example of the study of carbonization on the large scale, it may be mentioned that special attention has been paid to the increased output of gas from vertical retorts which may result from either blending and briquetting or screening coal prior to its carbonization. The economics of the use of different proportions of steam in vertical retorts for making additional water gas have also been studied in a preliminary way. This appears to be essentially a problem for which the special facilities of the experimental carbonizing plant are required before much further progress can be made.

Several complete thermal balances of retort settings and waste-heat boilers have been prepared; and as a result attention has been focussed upon the leakage of gas through the walls of retorts.

Bye-Products of Coal Carbonization.

Although the staffs in the laboratories attached to the gas-works are not concerned with the manufacture of finished products from the crude tar, liquor, and spent oxide, it is found that a study of the properties of the bye-products is essential to the elucidation of coal carbonizing problems, since the nature of the products is determined very largely by the exact details of carbonizing conditions. In this connection, a study has been made of the relationship between carbonizing conditions and the free carbon content of tar.

Coke.

The combustibility and other general properties of coke produced under different conditions have been studied, in order to determine the influence of carbonizing conditions upon those properties, and in order to determine the most suitable grade of coke to be supplied for use by consumers in different types of appliances. Apparatus has been devised for the combustion of coke under conditions which may be controlled and ascertained.

The selection of the coke most suitable for the manufacture of water gas also presents problems of particular interest to the chemist, because of the consideration that for the highest efficiency of operation it appears desirable to have a coke with a high degree of reactivity towards steam during the gas-making run, while the reactivity towards carbon dioxide during the air-blow should not be so high as to result in excessive thermal loss due to the formation of carbon monoxide.

Low-Temperature Carbonization.

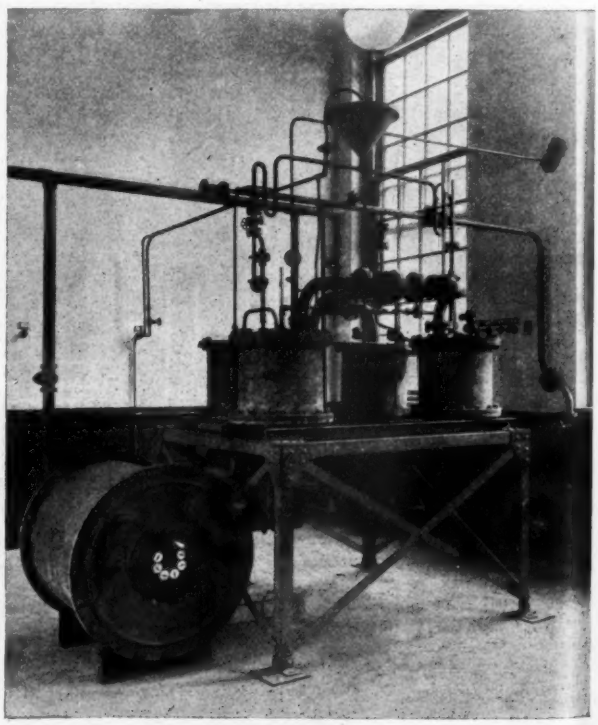
The low-temperature carbonization plant, designed by the Fuel Research Board, which is being erected at the Company's works at Richmond will have a capacity of 100 tons of coke per day. In connection with it, a unit of the Hird type of retort is also being erected, which will deal with small coal. Adjacent to the experimental carbonizing plant at Fulham a Salermo low-temperature retort has been erected, to enable the Company to study the suitability of this type of continuously-operated plant for dealing with various kinds of English coals. It is hoped that a careful study of the results obtained from these several plants will yield information valuable not only to the Company, but to the whole of the coal-treating industries.

Naturally, the tars resulting from the low-temperature carbonization of different coals will be the subject of considerable attention in the research laboratory.

Extraction of Benzole from Coal Gas.

During the past four years considerable attention has been paid in several of the works laboratories to the extraction of benzole from coal gas by means of activated carbon. The suitability of carbon for this purpose has been suggested on several occasions; and the process has been tried on a large scale on the Continent. It was found, however, that in contact with coal gas the activity of the carbon diminished at such a rate that the cost of replacing it was excessive.

The Company's experiments have shown that the depreciation of the carbon is due to the polymerization of certain unsaturated hydrocarbons to give non-volatile products, and that this polymerization takes place particularly when the crude benzole is heated in contact with the carbon. It may be minimized by removing the benzole from the carbon as quickly as possible during the process of steam distillation of the benzole, and by decreasing the time usually allowed for the heating-up of the carbon. It has also been found that traces of iron carbonyl, which may be either present in the gas or formed by contact between the gas and the hot surfaces of the apparatus, are absorbed very efficiently by the carbon, and that the absorbed



No. 2 Laboratory.

iron exerts a catalytic effect upon the polymerization of the unsaturated hydrocarbons.

Experimental work is proceeding in connection with these matters, and also a large-scale plant is being erected at one of the Company's works. Benzole is now recovered at several of the works by the more generally known process of oil washing; and various studies have been made of the efficiency of the process and of the quality of the recovered benzole.

AMMONIA.

General interest in all questions associated with ammoniacal liquor has been stimulated not only by a realization of the necessity for making a stronger liquor so as to economize in transport and distillation charges, but also by the difficulties experienced in certain localities in connection with the disposal of effluent liquors. Owing to the distance which separates some of the works from the ammonia products works, the Company have been particularly interested in the possibility of reducing the charges for transport of liquor by increasing the strength of the liquor recovered at the gas-works. Whatever the amount of ammonia recovered may be, the bulk of liquor produced depends upon the moisture content of the gas leaving the retort and the amount of water used in the washing system. The minimum quantity of water which is required for the complete removal of ammonia can only be determined from a knowledge of the distribution of ammonia between gas and ammoniacal liquor under the conditions of temperature and concentration which exist in the recovery plant.

The general principles of ammonia washing are, of course, widely appreciated; but there appears to be a definite lack of quantitative information. Indeed, the Company have found it necessary to determine for themselves the strength of liquor in equilibrium with gas containing different concentrations of ammonia at different temperatures. A study of the equilibrium data has emphasized the necessity for further cooling of gas prior to ammonia extraction, and has indicated the possibility of entirely eliminating the use of water for washing the gas, provided that the process of condensation is carried out in two stages, so as to obtain a very weak ammoniacal solution during the first stage. This process is being thoroughly investigated on a large scale at two of the gas-works. In connection with this large-scale investigation, a general study is being made of the efficiency of gas condensers and washers.

MANUFACTURE OF CARBURETTED WATER GAS.

The plant and process for the manufacture of carburetted water gas were developed when the primary object of enrichment of the gas by the cracking of gas oil was to enhance the illuminating power of the gas. In view of the decreased importance of the illuminating power standard, it was decided some time ago to examine in some detail the cracking of gas oil with particular reference to thermal efficiency. Methods of analysis of the oil have been developed; and it has been shown, both in the laboratory and on the works, that there is a direct relationship between the thermal yield of gas obtainable and the proportion of open-chain hydrocarbons in the oil. A study has also been made of the efficiency obtainable by means of certain innovations such as the back-run process and the self-clinkering grate, which have been introduced on the works.

PURIFICATION OF GAS.

The well-known process of removal of hydrogen sulphide from gas by means of iron oxide is cheap and efficient; but it suffers from the defect that it occupies a considerable amount of ground space. With the steady growth in the output of gas from the Company's works, this is becoming a serious consideration; and it is proposed to make further laboratory studies of several processes which may lead to an economy in ground space. Already the process of liquid purification by means of iron oxide suspended in a solution of sodium carbonate has been thoroughly investigated in America.

DEHYDRATION OF GAS.

Owing to the part played by water vapour in the corrosion of gas holders, mains, and services, and owing to the expense of removal of condensed water from the gas distribution system, consideration has been given to the removal of a part of the water vapour from coal gas. The whole of the gas leaving one of the Company's smaller works is being treated by means of a solution of calcium chloride; and the effects of this treatment are being studied in the laboratory.

STANDARD GAS-WORKS TESTS.

All the various chemical and physical tests which are required from day to day on a modern gas-works have been standardized by a Committee of Chemists, so that accurate comparison may be made between the results obtained at the several works.

OTHER CHEMICAL WORK.

It should not be forgotten that the Company's research and routine chemical work is not limited to that already described. The conversion of the residuals into various marketable chemical products is continuously studied in the laboratories at the

NO. 3 LABORATORY.

bye-products works at Beckton by a special staff of chemists; while problems of gas consumption are studied at special laboratories at Watson House, Nine Elms, and at the industrial apparatus workshops in the city.

The Company's interest in gas chemistry has also been expressed by a close contact with the work of the Universities. The gas industry, as is well known, is closely connected with the work of Prof. Cobb at Leeds University, where an experimental plant has been erected in memory of the late Sir Corbet Woodall, formerly Governor of the Company. A research fellowship has also been endowed by the Gas Light and Coke Company at Imperial College, London University; and, under the inspiration of Prof. Bone, the holders of this fellowship have carried out much interesting work. The Company are also closely connected with Prof. Bone's work on high-pressure reactions. Only last year the Directors joined with Imperial Chemical Industries and others to endow and support new chemical engineering laboratories for University College, London.

THE NEW LABORATORIES.

No. 1 Laboratory, on the first floor, occupies a floor space of about 2700 sq. ft., and will be used exclusively for general chemical research. Less than the usual proportion of floor space has been filled up with fixed benches, so that movable tables may be arranged to suit the requirements of any particular apparatus. Adjacent to this laboratory there are a balance room, offices, and cloak room. On an upper mezzanine floor there is a conference room and a beautifully fitted library, with accommodation for about 4000 books.

No. 2 Laboratory, on the ground floor, will be kept as free as possible from fixtures, and reserved for technical and semi-large scale work. There is an ample provision of flue outlets concealed in the walls; and the usual gas, air, vacuum, water, and electric services are available just above head level.

No. 3 Laboratory will be used partly for research and partly for the chemical control of the operations carried out at the Fulham Works. On a mezzanine floor there is an office overlooking No. 3 Laboratory.

In the basement there are five store rooms (some of which may be converted ultimately to small laboratories, if necessary), and also an optical laboratory, a photographic dark room, a thermostat room (in which trials are being made of new recording calorimeters), a compressor room (in which gas and air compressors and a vacuum pump are installed), a power room (in which are fitted the main electrical switches and a motor converter for the supply of low-voltage current to the laboratories for electrolytic work), a furnace room with central heating apparatus, and a cloak room. There is a special entrance at the back of the laboratory for goods, which are delivered on to a lift whereby they may be conveyed to the basement or to any of the upper floors.

All the main benches in the laboratories are so constructed that one half may be pulled away to expose the service pipes and drains. The services comprise high and low pressure gas, coal gas for testing purposes (as distinct from the mixture of coal gas and carburetted water gas), compressed air, vacuum, water, steam, and electric power. Service pipes are painted in different colours and fitted with differently designed cocks, to aid in identification.

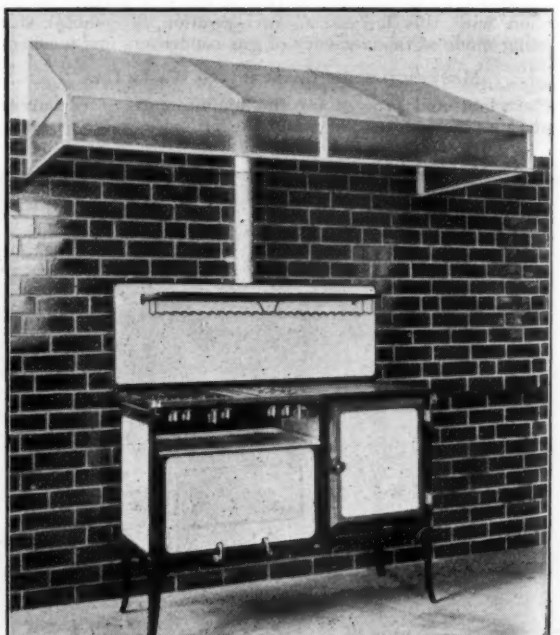
The provision of a workshop for making experimental apparatus has been deferred until the second half of the building is erected. Meanwhile, the resources of the Fulham workshops adjacent to the laboratories are available, together with those of other special workshops of the Company.

BIRMINGHAM JUVENILE COURT.

All-Gas Service for a Newly-Opened Building.

The new Juvenile Court in Steelhouse Lane, Birmingham, which was opened on July 17 by Sir William Joynson-Hicks, the Home Secretary, is equipped throughout with gas for heating and cooking.

Fourteen built-in gas grates of the "injector-ventilator" pattern, including a number of "Vandyke" models in copper finish, have been provided for the entrance hall, offices, and waiting rooms. These appliances have been supplied by Messrs. John Wright & Co., of Birmingham (Radiation Ltd., Proprietors), and harmonize admirably with the decoration of the rooms. The spacious tiled kitchen of the new building is equipped with an elevated "Eureka New World" gas range of the latest type in porcelain enamel. This appliance, which is also made by the above firm, is fitted with "Regulo" automatic heat control and safety gas taps. A gas boiler in the scullery completes the equipment.



The "Eureka New World."

Reducing Labour Costs without Reducing Wages.—Many manufacturers to-day would welcome the opportunity of reducing their labour costs by two-thirds without having to reduce wages. This is the enviable achievement of a well-known firm of metallic paint manufacturers. For a certain operation involving the application of heat, they originally used solid fuel. They decided, however, to experiment with town gas, despite the fact that, unit for unit of heat required, it might cost slightly more. The result is a striking testimonial not only to their enterprise, but to their sound judgment in taking all factors into account when considering the economy or otherwise of a given fuel. As a result of the change-over they found that: (1) The output per 50-gallon tank was increased by 150 p.ct.; (2) the factory floor space required per 50-gallon tank was decreased by 68 p.ct.; and (3) the labour costs per boil were reduced by 68 p.ct. Actually the saving in labour involved in supervising the boiling operation covered more than twice over the total cost of the gas used. The case mentioned is one of a number given in No. 173 of "A Thousand-and-One Uses for Gas" (published by the "B.C.G.A."), which deals with some processes involved in the manufacture of paints and varnishes.

WORKING OF A WATERLESS (M.A.N.) HOLDER AT GENNEVILLIERS.

[A Paper by M. A. Bazille before the French Annual Gas Congress, 1928.]

In November, 1925, the Société d'Eclairage, Chauffage et Force Motrice [whose distribution system encircles Paris and links-up the suburbs] put into commission at the Gennevilliers Works a 6000 cub.m. [212,000 c.ft.] M.A.N. holder to deal with the carburetted water gas from a large new installation.

The gas before reaching the holder is simply washed and cooled to a temperature of about 20° C., at which point there remains in it a considerable amount of water of saturation and mist. In winter, the cold sides of the holder cause partial condensation of the water vapour; and at all seasons the arrival of the gas in what amounts to an expansion chamber tends to the deposition of the entrained water. Thus there is normally a steady accumulation of water at the bottom of the holder; and unless precautions are taken, irregularities of working, and even a stoppage, may take place, as will be shown.

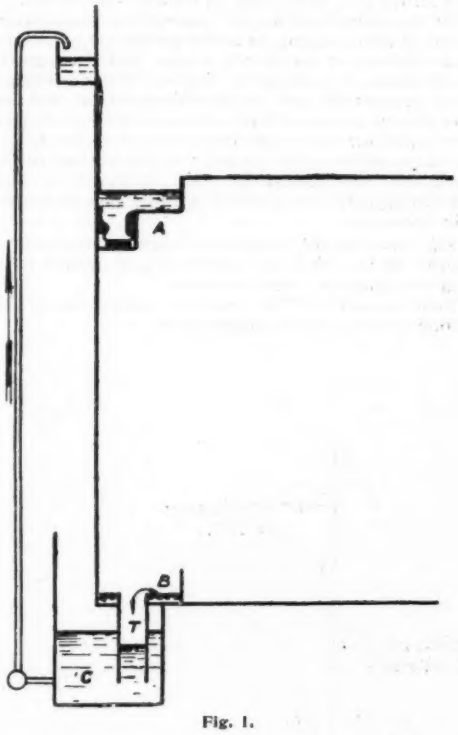


Fig. 1.

In fig. 1, A is the seal for the disc, and is of special design and filled with tar to a sufficient depth to prevent the gas escaping between disc and walls; and as is known, precautions are taken to limit the flow of tar from the seal down the walls. However, absolute tightness is impossible, and the tar runs down in greater or less quantity more or less according to its fluidity. Round the base of the cylinder it is collected in a channel B, whence it passes by way of syphons T into sumps C. Thence the tar is again raised to the seal by electric pumps which are automatically put in and out of action; a float causing completion of the electric circuit when the tar reaches the maximum permissible height H_1 in the sump, and breaking circuit when the level falls to the minimum H_2. Thus normally no interference should be necessary.

The Water Trouble.

When water is carried in by the gas, it floats on the tar and finds its way through the syphons into the sumps. Taps are provided on the latter, and thereby the water may be partly run-off; but if much water is coming through, this means frequent attention and may even amount to a whole-time job for one man. It is conceivable that an engineer not forewarned might let the matter slide until at length the pumps were raising water, which would mix with the tar in the seal. Thus the fluidity of the sealing mixture would get greater and greater, the flow would increase, and finally the pumps might be found working continuously. Then would security be seriously threatened, for a single breakdown in the pumping system might upset the disc.

And How Overcome.

Faced with this possibility, one of the E.C.F.M. Engineers, M. Russier, designed and applied a special arrangement for automatically draining away the water; and the Company are of opinion that this simple modification—which puts the finishing touch to a system of gas storage that has developed far in Germany and is now extending in France and elsewhere—should be introduced to others.

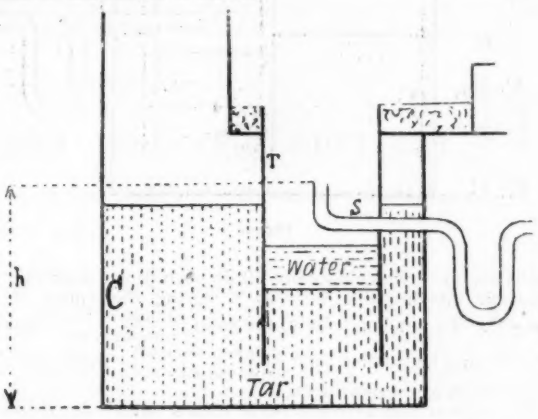


Fig. 2.

In fig. 2 it will be seen that the modification consists simply in the addition of a syphon S of which the inner end is fixed at such a level h that, the tar and water naturally separating out in the chamber T, water only will be syphoned out by S while tar only will pass through T into the sump.

An Elementary Calculation.

For each gasholder a simple calculation must be made to determine the level h and to ascertain whether the maximum and minimum tar levels H_1 and H_2, on which depends the functioning of the pumps, are co-ordinated.

H_1, as a matter of fact, is really a factor of the design; but at the same time it pays to have it as large as possible, giving the maximum interval between pump runs, and so the maximum time for separation of the tar and water mixture.

The syphon inlet h is fixed in relation to H_1 by the following condition. At the moment of arrival of the tar at level H_1 in the sump, there must remain in chamber T, between the theoretical tar-water separation level and h, a sufficient layer of water to assure there being no drainage of tar through S—at Gennevilliers 18 cm. of water was decided upon as giving this assurance. In these circumstances, if the pressure in the holder is 12 cm. W.G. and the density of the tar d, h is derived from the equation

$$[H_1 - (h + 18)]d = 12 + 18$$

$$\text{whence } H_1 - h = \frac{30 - 18d}{d}.$$

Taking 1·2 and 1·1 as limits for the tar density, we arrive at extreme values of 7 and 9 cm. for $H_1 - h$; and accordingly we have fixed the syphon inlet 8 cm. below the maximum tar level H_1 (see fig. 3).

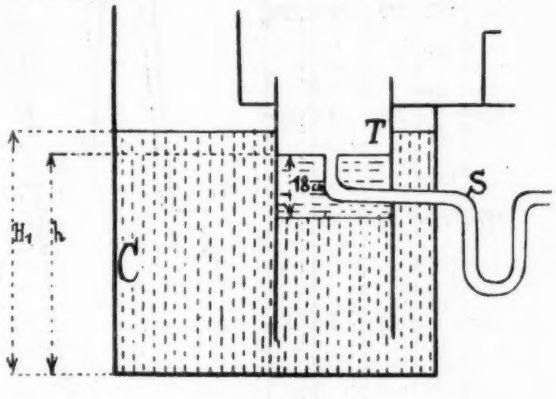


Fig. 3.

The minimum tar level H_2 is arrived at by the following argument. When the tar in the sump has fallen to H_2, there must still be a depth of tar in T, between the theoretical tar-water separation line and the bottom of T, sufficient to assure that not a drop of water is carried through into the sump. We settled upon 17 cm. for this figure, and arrived at H_2 by a simple pressure equation (see fig. 4).

Other Considerations.

These three levels having been determined, the regular functioning of the holder is assured for every case, provided that

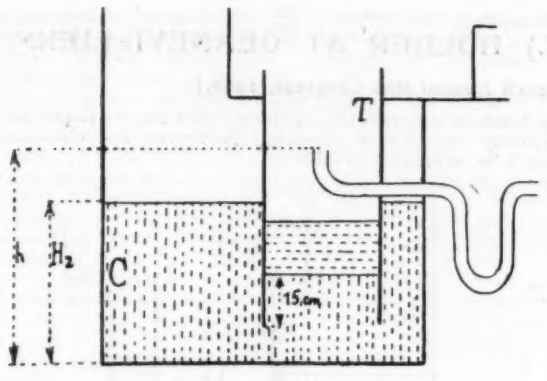


Fig. 4.

condensation of water does not attain such proportions that the water-tar dividing line falls in T during the filling of the sump C. To put it precisely, the ratio $\frac{\text{volume of water}}{\text{volume of tar}}$ flowing into T must be greater than $\frac{\text{horizontal section T}}{\text{horizontal section C}}$. Such a case has never arisen at Gennevilliers.

The syphon should have some means attached to provide against the possible breakdown of the pumps, in which eventuality the tar might rise above the upper mark in the sump and above *h* in T, so finding an outlet through the syphon. The simple arrangement of a float-controlled plug will guard against this.

The E.C.F.M. have proved the efficiency of the installation by introducing measured quantities of water, and noting that substantially the whole is recovered from the syphon outlet.

Since this modification has been applied, the working of the holder has given rise to no criticism. The tar raised by the pumps is practically free from water; and no water has been detected on top of the tar in the seal.

NATURE OF THE TAR.

It is the fluidity of the tar which, for a given gasholder, determines the total flow into the seal and consequently the number of pump runs and aggregate pumping time. It is essential to maintain an adequate depth of seal, and thus the pumping system must be protected from any prolonged breakdown. A high-viscosity tar tends to short pumping, but invites the possibility of mechanical failure; excessive fluidity may give rise to continuous pumping which, apart from considerations of cost, is fraught with danger.

The ideal to aim at in normal working would seem to be constant fluidity or viscosity—or constant "apparent consistency"—of the tar, whatever the temperature. Such perfection obviously cannot be obtained, for various reasons. Start with tar of selected consistency, and in its hourly work it finds conditions most favourable to the changing of its nature; and in its circuit the mixture of hydrocarbons of which it is composed is exposed alternately to the atmosphere and to the gas within the holder. When the latter is used for the storage of fully purified gas, thickening of the tar must result.

But the seasonal variation of atmospheric temperature must also be taken into account, in so far as the tar will become less viscous as the warm weather develops, and vice versa; and it will be advisable, if coal gas or blue water gas is being stored, to extract periodically part of the thickened tar and replace it with less viscous tar or with oil, anthracene for preference.

In our particular case, contrary to what we expected—indeed, to general experience—the viscosity of the sealing medium did not increase. The reason for this anomaly we discovered through the graphic record which we keep, as shown in fig. 5. It will be observed—

(1) That the viscosity of the tar, taken at constant temperature, 18° C., increases rapidly as carburation of the blue gas is cut-down, and vice versa.

(2) That viscosity at T° C. naturally depends upon the variations of atmospheric temperature.

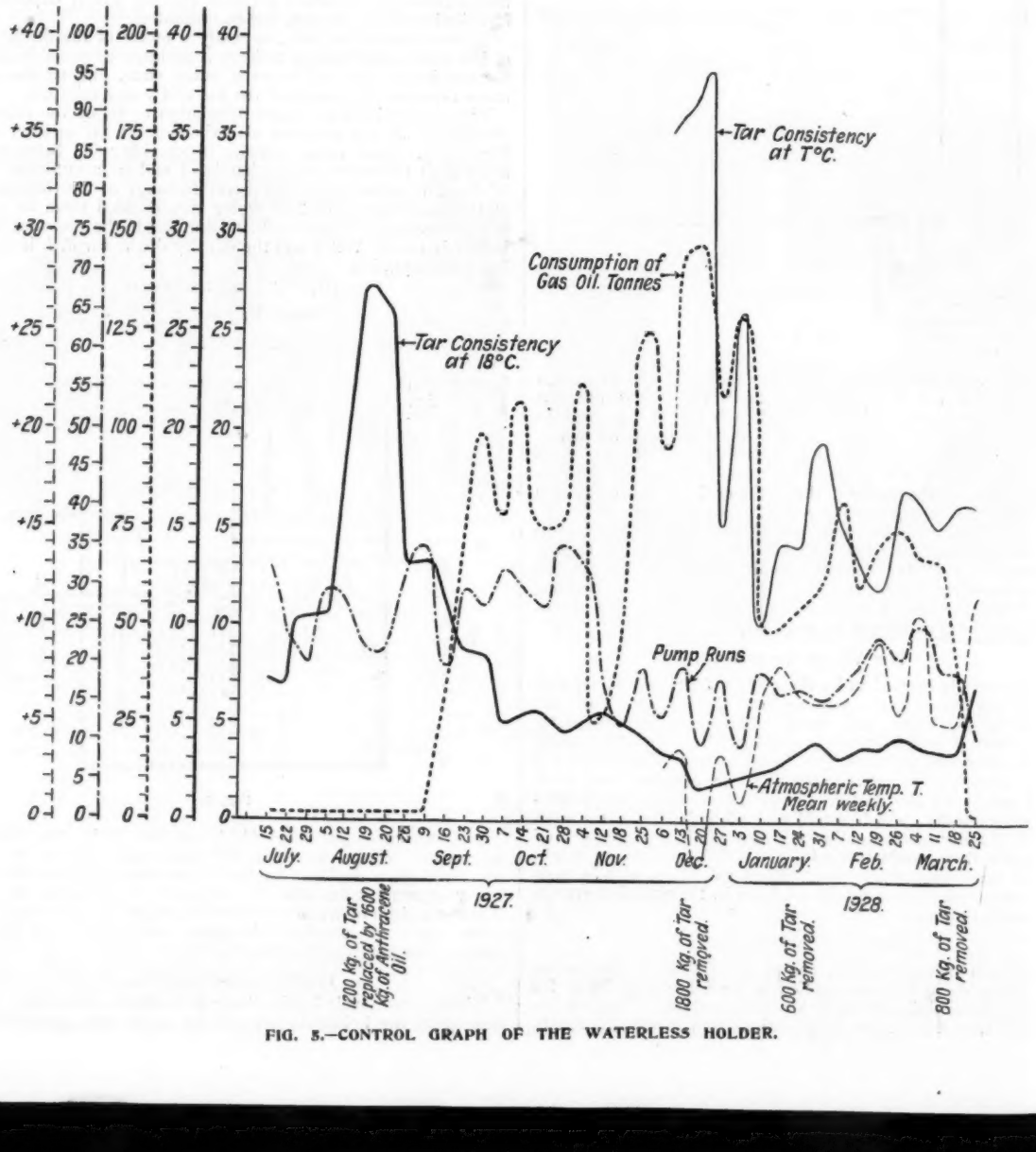

Tar Consistency at T°C.
Consumption of Gas Oil. Tonnes
Tar Consistency at 18°C.
Pump Runs
Atmospheric Temp. T. Mean weekly.
July. August. Sept. Oct. Nov. Dec. January. Feb. March.
1927.
1928.
1200 Kg. of Tar replaced by 1600 Kg. of Anthracene Oil.
1800 Kg. of Tar removed.
600 Kg. of Tar removed.
800 Kg. of Tar removed.

FIG. 5.—CONTROL GRAPH OF THE WATERLESS HOLDER.

(3) That the number of pump runs depends upon atmospheric temperature and so upon the consistency of the tar at T° C.

It is clear that the fluidity of the tar, at a given outside temperature, is greatly influenced by the quantity of gas oil used for carburetting. Some of the hydrocarbons brought in by the gas are dissolved by the tar, which presents for the purpose a very large surface, lower its viscosity (and density), and increase its volume. Hence the necessity for periodic removal of a part of the sealing fluid. Examination of the graph also reveals that this dilution of the tar by constituents of the gas is to a certain extent compensated, so far as fluidity is concerned, by the thickening which develops under the conditions of working (as mentioned above).

Another point to observe is that the extent of the periodic draining is also influenced by the total volume of carburetted gas passing through the holder, and also by the temperature of the gas after condensation, which to some extent determines the content of hydrocarbons absorbable by the tar.

THE PRODUCTION OF SMOKELESS DOMESTIC FUEL.—VI.

By JOHN ROBERTS, D.I.C., M.I.Min.E., F.G.S., Author of "Coal Carbonization: High and Low Temperature."

(*Continued from p.* 212.)

THE MACLAURIN SYSTEM.

Though there are cases where the adoption of briquetting offers advantages in carbonization, it must not be overlooked that briquetting itself adds to the initial capital outlay and the running costs of the process. This is augmented where pitch binders have to be employed. On the other hand, the smaller sizes of fuel can be treated in this manner. In the Maclaurin system, which is the third producer-type system to be described, no briquetting is employed, and the coal treated is of much coarser grade. The plant will not deal with slack, for reasons mentioned in a previous article. The best size of coal to use is that known in the trade as "Jumbo" nuts; but trebles and large coal could be used. Feebly-coking coals are preferred. When large coal is used it is broken down to pass a 6-in. mesh, and is then elevated to the top of the retort, which is about 30 ft. high, and lined with firebrick. The internal dimensions at the top are 5 ft. square, at the tuyere zone 8 ft. square, and at the base 7 ft. square. Thus it will be seen that this retort also resembles a blast furnace in form. Steam and air are blown in at the tuyere zone through suitable ports, the amount being controlled in order that the required temperature may be maintained in the retort. Partial combustion takes place in this zone, and the hot gases, consisting of volatile distillation products, water gas, and products of combustion, pass up through the charge, and impart their heat to the coal. The liquid distillates are trapped at the top of the retort, and conducted to settling tanks. The gases also leave at the top.

The fuel descends from the low-temperature distillation zone to the zone of combustion, and then to the cooling chamber below. The actual descent from the top to the bottom takes about 20 hours—that is to say, carbonization progresses sufficiently in that time. At the end of every hour, about 11 cwt. of coke is dropped through the extractors, it having been cooled meanwhile by steam blown into the cooling chamber.

MACLAURIN PRODUCTS.

The Maclaurin process has been in operation at the Dalmarnock Gas-Works, Glasgow, for three years; and as its use is being continued, it may be said to have achieved its purpose. A yield of about 33,850 c.ft. of gas of about 240 B.Th.U. per c.ft. is obtained from one ton of coal; and this gas can be dealt with at the works. In addition, the following products are obtained, the figures being the average for three months ended February, 1927, as stated by Maclaurin at the Birmingham Carbonization Conference in February last.

Oil (galls.)	20·38, water content about 4 p.ct.
Sulphate of ammonia (lbs.). .	31·94
Solid fuel (cwt.)	9·9

The crude oil is credited by the Corporation Chemical Works to the plant at 6d. per gallon. It is not likely to be used for fuel purposes so long as creosote oils fetch higher prices than fuel oil, as the Maclaurin oil is rich in phenolic compounds. It is a thick brownish oil having a specific gravity of about 1·04, and containing little free carbon.

"KINCOLE."

The solid smokeless fuel is known as "Kincole." It is graded for the market in three sizes. The fines are used for boiler firing, and, of course, could be used for pulverized-fuel firing. The medium-sized fuel is suitable for anthracite stoves and coke boilers. The larger size is used for domestic open fires and kitchen ranges, though it is claimed to be hard enough for use in Scotch blast furnaces. The volatile content ranges from 4 to 6 p.ct., the ash content 7 to 8 p.ct., and it is free burning. Though a high reactivity is claimed for it, it would not be classed in the front rank as a smokeless domestic fuel, but it should prove very serviceable, and would be far superior to the original raw coal for that purpose.

FUTURE OF THE MACLAURIN PROCESS.

Maclaurin visualizes his process as being most economically worked at the pithead, supplying cheap gas over a wide area to a number of gas-works, all interlinked and worked under one authority, like the Electricity Board. The colliery companies would thus become manufacturers of smokeless fuel and oil, and suppliers of gas in bulk. The chief argument brought forward in support of this is that a 240 B.Th.U. gas can be manufactured in great quantity so cheaply by this process that it could be sold to industries in the neighbourhood at a price which would induce them to turn from the use of raw coal to gas as a source of heat and power. Large-scale production would bring down the cost of the gas to domestic consumers so that its use would be extended. The fact that low-grade gas is used at Nuneaton for cooking, heating, and lighting is held to support this view.

It is doubtful whether the policy of producing high yields of low C.V. gas and disposing of it will prove a more practicable and economic proposition than the manufacture of lower yields of higher C.V. gas at coke ovens, as is likely to be accomplished on a large scale when ovens are adapted for the production of smokeless domestic fuel, as will prove to be the case within the next twelve months.

The advantages claimed for Maclaurin gas over non-recovery producer gas are: "(*a*) Its flame temperature is from 200° to 300° C. higher. (*b*) It radiates heat more freely. (*c*) It gives a longer flame, and therefore less local heating. (*d*) Being cool and clean, it is more easily distributed throughout a works. (*e*) The calorific value varies very little from 240 B.Th.U. Because of (*d*) and (*e*), the temperature in furnaces can be very readily controlled." It is quite obvious, however, that a ready outlet for gas for industrial purposes must be available if this process is to be successful on a large scale. A similar remark applies to the Nielsen, or "L & N," system.

THE "L & N" PROCESS.

A large yield—35,000 to 40,000 c.ft. per ton—of gas characterizes the "L & N" system of low-temperature carbonization, in which the coal is treated in a rotary retort, internally heated by means of producer gas generated in a producer. The retort, which resembles a calcining kiln, is arranged in an inclined position; the coal being fed in at the higher end. As the retort rotates, the fuel is propelled forward and is heated by contact with the gas from the producer located at the lower end of the retort. The products of distillation of the coal thus become mixed with the producer gas, giving a high yield of gas of about 200 B.Th.U. per c.ft. The carbonized product moves forward until it reaches the automatically-controlled opening into a coke cooling chamber, where the coke is cooled out of contact with air.

The sensible heat of the producer gas is not wasted, as no intermediate cooling takes place, the heat being utilized direct in raising the temperature of the coal, the gas passing countercurrent to the coal. As the retort rotates, the coal is continually stirred and turned over, thus bringing each particle in turn in contact with the hot gas. If the particles of coal are sufficiently fine, the low conductivity of the material is neutralized to a great extent, and rapid coking is accomplished. Where "sticky" or strongly-swelling coals are employed, the addition of a proportion of coke breeze has been found advantageous, resulting in an improved semi-coke. The plant will deal with slacks and with nut sizes, and is continuous in operation. It has also been proposed to manufacture smokeless briquettes from the fines; the material being pressed while hot, so as to avoid the use of pitch. The manufacture of industrial smokeless fuel for pulverized-fuel firing is receiving the attention of the proprietors of this process, and in all probability this will prove the best field for this type of plant. The advantages of powdered semi-coke are that it can be stored without risk of spontaneous combustion, and can be pumped much in the same way as oil fuel. When such fuel contains from 10 to 15 p.ct. of volatile matter, it is eminently suitable for use in power plants; the particles offering a maximum of surface favourable to rapid combustion.

A unit has been in operation at Barnsley for some time, and another plant is approaching completion in Leicestershire. The process is controlled by Sensible Heat Distillation, Ltd.

GAS UNDERTAKINGS RETURN FOR 1927.

PART I.—MANUFACTURE AND SUPPLY OF GAS.

[For Comparative Table covering the eight years 1920-1927 inclusive, see "JOURNAL" for July 25, p. 201.]

As intimated last week, the first part of the Board of Trade Return relating to all Authorized Gas Undertakings in Great Britain for the year 1927 has been issued by H.M. Stationery Office, Adastral House, Kingsway, London, W.C. 2, and Branches, at the price of 5s. net. Part I. is that which contains particulars relating to the manufacture and supply of gas.

The number of undertakings dealt with in the return on this occasion is 782.

QUANTITY OF GAS MADE AND SOLD, AND NUMBER OF CONSUMERS.

The quantity of gas made during 1927 was 1,615,447,000 c.ft. (0·5 p.ct.) in excess of the quantity made in 1926. An increase (19,541,161,000 c.ft., or 8·6 p.ct.) occurred in the quantity of coal gas made; but the quantity of water gas made decreased by 18,179,395,000 c.ft., or 27·8 p.ct., from the abnormal figure reached in 1926—the quantity made in 1927 being slightly less than in 1925. The coal carbonized was more than in 1926 by 1,139,421 tons; but 401,051 tons less of coke and 36,702,858 gallons less of oil were used in the manufacture of water gas. The coke and breeze made in 1927 was more than that made in 1926 by 762,442 tons, and the tar made was more by 14,420,614 gallons. The quantity of gas sold increased by 3,632,915,000 c.ft., or 1·3 p.ct. The number of consumers increased by 281,778, or 3·3 p.ct.

FIGURES FOR ENGLAND AND WALES AND SCOTLAND.

There are given in the comparative table the totals for the whole of the authorized gas undertakings in Great Britain. The separate figures for England and Wales and for Scotland for the last three years are as follows:

1927.

England and Wales.—Coal carbonized, 16,115,349 tons; coke for water gas, 986,691 tons; oil used, 60,585,230 gallons. Coal gas made, 224,023,359,000 c.ft.; water gas, 45,154,669,000 c.ft.; total gas made, 273,631,329,000 c.ft. Sold to prepayment consumers, 92,611,437,000 c.ft.; to ordinary and power consumers, &c., 156,408,337,000 c.ft.; for public lamps, 8,907,469,000 c.ft.; total quantity sold, 257,927,243,000 c.ft. Coke and breeze made, 10,919,032 tons; tar, 182,006,794 gallons; sulphate of ammonia, 111,426 tons. Number of prepayment consumers, 4,456,426; ordinary consumers, 3,410,272; total number of consumers, 7,866,698. Length of gas mains, 42,130¼ miles.

Scotland.—Coal carbonized, 1,588,244 tons; coke for water gas, 47,830 tons; oil used, 415,306 gallons. Coal gas made, 22,090,292,000 c.ft.; water gas, 1,975,689,000 c.ft.; total gas made, 24,066,126,000 c.ft. Sold to prepayment consumers, 6,908,638,000 c.ft.; to ordinary and power consumers, &c., 14,345,797,000 c.ft.; for public lamps, 1,019,884,000 c.ft.; total quantity sold, 22,274,319,000 c.ft. Coke and breeze made, 1,020,343 tons; tar, 19,959,412 gallons; sulphate of ammonia, 14,375½ tons. Number of prepayment consumers, 330,852; ordinary consumers, 488,789; total number of consumers, 819,641. Length of gas mains, 3690¾ miles.

1926.

England and Wales.—Coal carbonized, 14,972,314 tons; coke for water gas, 1,401,232 tons; oil used, 97,388,134 gallons. Coal gas made, 204,491,813,000 c.ft.; water gas, 63,685,177,000 c.ft.; total gas made, 272,376,668,000 c.ft. Sold to prepayment consumers, 92,717,289,000 c.ft.; to ordinary and power consumers, &c., 154,232,476,000 c.ft.; for public lamps, 8,016,187,000 c.ft.; total quantity sold, 254,965,952,000 c.ft. Coke and breeze made, 10,178,658 tons; tar, 163,967,049 gallons; and sulphate of ammonia, 98,757¾ tons. Number of prepayment consumers, 4,260,199; ordinary consumers, 3,335,756; total number of consumers, 7,595,955. Length of gas mains, 40,860½ miles.

Scotland.—Coal carbonized, 1,591,858 tons; coke for water gas, 34,340 tons; oil used, 315,260 gallons. Coal gas made, 22,080,677,000 c.ft.; water gas, 1,624,576,000 c.ft.; total gas made, 23,705,340,000 c.ft. Sold to prepayment consumers, 6,584,092,000 c.ft.; to ordinary and power consumers, &c., 13,872,051,000 c.ft.; for public lamps, 1,146,552,000 c.ft.; total quantity sold, 21,602,695,000 c.ft. Coke and breeze made, 998,275 tons; tar, 23,578,543 gallons; sulphate of ammonia, 17,506½ tons. Number of prepayment consumers, 319,492; ordinary consumers, 489,114; total number of consumers, 808,606. Length of gas mains, 3610 miles.

1925.

England and Wales.—Coal carbonized, 15,483,446 tons; coke for water gas, 1,119,452 tons; oil used, 61,217,483 gallons. Coal gas made, 210,156,509,000 c.ft.; water gas, 46,646,040,000 c.ft.; total gas made, 261,099,797,000 c.ft. Sold to prepayment consumers, 86,501,296,000 c.ft.; to ordinary and power consumers, &c., 149,774,319,000 c.ft.; for public lamps, 8,839,808,000 c.ft.; total quantity sold, 245,115,423,000 c.ft. Coke and breeze made, 10,459,165 tons; tar, 171,777,349 gallons; sulphate of ammonia, 109,243¾ tons. Number of prepayment consumers, 4,136,354; ordinary consumers, 3,264,355; total number of consumers, 7,400,709. Length of gas mains, 39,677¾ miles.

Scotland.—Coal carbonized, 1,547,726 tons; coke for water gas, 33,961 tons; oil used, 165,166 gallons. Coal gas made, 21,191,172,000 c.ft.; water gas, 1,527,251,000 c.ft.; total gas made, 22,718,511,000 c.ft. Sold to prepayment consumers, 6,245,991,000 c.ft.; to ordinary and power consumers, &c., 13,284,762,000 c.ft.; for public lamps, 1,111,177,000 c.ft.; total quantity sold, 20,641,930,000 c.ft. Coke and breeze made, 939,217 tons; tar, 22,390,955 gallons; sulphate of ammonia, 16,631¼ tons. Number of prepayment consumers, 310,264; ordinary consumers, 489,482; total number of consumers, 799,746. Length of gas mains, 3500¼ miles.

COMPANIES AND LOCAL AUTHORITIES.

In the return for 1927 the undertakings in the hands of companies and of local authorities are divided thus:

England and Wales.—458 companies; 248 local authorities.
Scotland.—4 companies; 72 local authorities.

DECLARATIONS OF CALORIFIC VALUE.

The first column of figures is devoted to the declared and the average (when the latter has been officially ascertained) calorific values of gas supplied. When noticing the returns for the six preceding years, lists were given of the following numbers of undertakings which had made declarations of calorific value; 1921, 184 undertakings; 1922, 162 undertakings; 1923, 134 undertakings; 1924, 49 undertakings; 1925, 42 undertakings; and 1926, 13 undertakings. To these may now be added the undertakings mentioned below, with their declarations in B.Th.U. made in 1927:

Bradford, 500	Halifax, 400	Thornton Cleveleys, 500
Coventry (Kenilworth area only), 400	Nelson, 425	Tiverton, 500
Croston, 600	Retford, 500	Warrington, 470
	Smethwick, 450	

ALTERATIONS IN CALORIFIC VALUE.

As in the year immediately preceding, there were in 1927 ten instances of undertakings making alterations in the calorific values that had previously been declared by them. It will be seen from the list below that some of these were in the upward, and others in the downward, direction:

Blackrod Gas Company—from 450 to 425 B.Th.U.
Brodsworth and District Gas Company—from 500 to 475 B.Th.U.
Burnley Corporation—from 475 and 450 B.Th.U. to 450 and 475 B.Th.U.
Commercial Gas Company—from 475 to 500 B.Th.U.
Conisbrough Gas Company—from 500 to 475 B.Th.U.
Drighlington and Gildersome Gas Light Company—from 500 to 525 B.Th.U.
Hoylake and West Kirby Urban District Council—from 520 to 500 B.Th.U.
Knutsford Light and Water Company—from 450 to 480 B.Th.U.
Lea Bridge District Gas Company—from 475 to 500 B.Th.U.
Troon Corporation—from 450 to 420 B.Th.U.

WATER GAS SUPPLIED.

As is customary, there is set out in the second column of the return the proportion of water gas supplied by various undertakings; the maximum and average figures being given. The following cases (with their percentages) are noted in which the maximum proportion of water gas reached 25 p.ct.

Aberystwyth, max., 33; av., 26·4.
Abingdon, max., 40; av., 24.
Accrington, max., 25; av., 23.
Ackworth, av., 25.
Aldershot, max., 56·7; av., 21·9.
Ascot, max., 28; av., 26.
Ashford, max., 44·2; av., 15·5.
Aylesbury, max., 37; av., 18·8.
Barnet, max., 37; av., 20.
Barnsley, max., 43·8; av., 19·2.
Barrow, max., 35·8; av., 13·1.
Barry, max., 60; av., 30.
Bath, max., 47·9; av., 25·8.
Berkhampstead, max., 36; av., 15.
Bexhill, max., 29·1; av., 16·7.
Bideford, max., 38·8; av., 24·3.
Biggleswade, max., 25; av., 20.
Birkenhead, max., 32·2; av., 14·6.
Bishop's Stortford, max., 57·2; av., 41·2.
Blackpool, max., 33; av., 11·4.
Blaenavon, max., 42; av., 35·5.
Bognor, max., 30; av., 20.
Bournemouth, max., 48·1; av., 34·8.
Brentwood, max., 48; av., 9·6.
Bridlington, max., 54·1; av., 37·1.
Brierley Hill, max., 28; av., 13.
Brighton, max., 44·75; av., 36·7.
Bristol, max., 41·6; av., 29·6.
Burnley, max., 72·2; av., 28·7.
Burton-upon-Trent, max., 51·5; av., 28·2.
Caernarvon, max., 30; av., 25.
Cambridge, max., 34; av., 33·7.
Cardiff, max., 39·4; av., 26.
Chesham, max., 36; av., 27·6.
Chester, max., 27; av., 17.
Chichester, max., 61·3; av., 30·3.
Cirencester, max., 30; av., 17.
Clacton, max., 59·5; av., 40·8.
Cleator Moor, max., 40·7; av., 24·7.
Colchester, max., 34; av., 17.
Colne, max., 55; av., 45.
Colwyn Bay, max., 45; av., 38.
Conway, max., 30; av., 25.
Coventry, max., 27·1; av., 16.
Crowborough, max., 37·2; av., 18·2.
Croydon, max., 38·4; av., 28·9.

Deal and Walmer, max., 40; av., 22.
Derby, max., 27; av., 17·6.
Doncaster, max., 51·6; av., 40·7.
Dorchester, max., 47·6; av., 29·3.
Dorking, max., 53; av., 24·2.
Dudley, max., 41·8; av., 9·6.
Eastbourne, max., 30; av., 25.
East Dereham, max., 60; av., 38.
East Grinstead, max., 40; av., 27.
East Hull, max., 41; av., 33·1.
Egremont, av., 40.
Exeter, max., 30·1; av., 7·6.
Felixstowe, max., 42·3; av., 24·7.
Fleetwood, max., 48·3; av., 18 75.
Gas Light and Coke Company, max., 31·4; av., 28·2.
Gloucester, max., 48·25; av., 26·1.
Gosport, max., 57·5; av., 47·2.
Gravesend, max., 32·1; av., 5·3.
Grays and Tilbury, max., 40; av., 23·4.
Great Yarmouth, max., 25; av., 5·3.
Guildford, max., 42; av., 34.
Halstead, max., 30; av., 29.
Hampton Court, max., 43; av., 32.
Harpenden, max., 46; av., 24.
Hartlepool, max., 37·3; av., 26·7.
Haslemere, max., 33; av., 20.
Hastings and St. Leonards, max., 50·9; av., 35·2.
Haverhill, max., 30; av., 25.
Hemel Hempsted, max., 47·8; av., 32·5.
Hereford, max., 65; av., 23·3.
Hertford, max., 45; av., 27.
Hessle, max., 37·3; av., 11·6.
Hoddesdon, max., 40; av., 20.
Honley, max., 30; av., 25.
Horley, max., 31; av., 20·6.
Hornsey, max., 56; av., 43.
Horsham, max., 45; av., 37.
Hull (British Gas Light), max., 44; av., 25·7.
Ipswich, max., 32·8; av., 22·9.
Irthlingborough, max., 53·6; av., 44·6.
Kendal, max., 32; av., 15.
Kettering, max., 40·3; av., 39·2.
Kidderminster, max., 30; av., 22.
Kidsgrove, max., 26; av., 26.
King's Lynn, max., 56·1; av., 31·7.
Kingston-upon-Thames, max., 35·6; av., 27·7.
Lancaster, max., 33; av., 0·4.
Lea Bridge, max., 49·9; av., 42·5.
Leamington, max., 26; av., 5·2.
Leatherhead, max., 40; av., 7·7.
Leeds, max., 29·4; av., 8·9.
Leigh, max., 39·3; av., 9·1.
Leighton Buzzard, max., 28; av., 9.
Lincoln, max., 33·3; av., 25·1.
Littlehampton, max., 25; av., 20.
Liverpool, max., 44·5; av., 38·7.
Llandudno, max., 30; av., 30.
Llanelly, max., 64·3; av., 54·1.
Llynvi Valley, max., 35; av., 25.
Loughborough, max., 30; av., 25.
Lowestoft, max., 45·2; av., 26·8.
Lymm, max., 30; av., 10·7.
Macclesfield, max., 60; av., 6·8.
Maidstone, max., 33·7; av., 27·9.
Malton, max., 43·3; av., 15·4.
Mansfield, max., 46·5; av., 35.
Marlborough, max., 38; av., 6·5.
Merthyr Tydfil, max., 48·2; av., 26·1.
Mid-Kent Gas Light Company, max., 35·3; av., 29·5.
Morecambe, max., 59·5; av., 8·4.
Newark, max., 30; av., 15.
Newport (Mon.), max., 45·1; av., 30·9.
Newport Pagnell, max., 43; av., 22·8.
Normanton, max., 31; av., 28.
North Middlesex, max., 66·3; av., 49·4.
Oldbury, max., 26·8; av., 16·5.
Otley, max., 29; av., 12·5.
Peterborough, max., 40·6; av., 24·2.
Pinner, max., 45; av., 32·8.
Plymouth Corporation, max., 62·3; av., 49·4.
Plymouth and Stonehouse Gas Company, max., 64·4; av., 38·8.
Pontefract, max., 35; av., 31.
Porthcawl, max., 41; av., 24·5.
Portsmouth, max., 43·3; av., 33·6.
Preston, max., 36; av., 26.
Ramsgate, max., 41·1; av., 15·1.
Raunds, max., 30; av., 20.
Reading, max., 44·2; av., 30·5.
Redhill, max., 64·1; av., 41·5.
Rhyl, max., 60; av., 21.
Rochdale, max., 25·2; av., 16·6.
Rochester, Chatham, &c., max., 46; av., 29·6.
Romford, max., 48·5; av., 25·7.
Rugby, max., 55·7; av., 38·4.
Rushden and Higham Ferrers, max., 55·5; av., 36·1.
Saffron Walden, max., 53; av., 36·5.
St. Albans, max., 40; av., 18·1.
Scarborough, max., 62; av., 53.
Seaford, max., 40; av., 20·5.
Seaham, max., 36·5; av., 15·2.
Selby, max., 40; av., 26.
Sevenoaks, max., 40; av., 25.
Shanklin, max., 30; av., 10·6.
Sheppy Gas Company, max., 30; av., 27·3.
Sheringham, max., 25; av., 20.
Shrewsbury, max., 29; av., 11.
Sittingbourne, max., 40; av., 33.
Slough, max., 30·5; av., 11.
Southampton, max., 55·3; av., 42·7.
Southend, max., 52; av., 49·8.
Southgate, max., 72·6; av., 51·2.
Southport, max., 31·5; av., 22·1.
South Suburban, max., 32·1; av., 24·6.
Spalding, max., 41·4; av., 25·5.
Spennymoor and Tudhoe, max., 25; av., 10.
Stafford, max., 25; av., 25.
Stockport, max., 29; av., 3.
Stockton-on-Tees, max., 51; av., 3·7.
Stoke-on-Trent, max., 38·3; av., 22.
Sutton, max., 32·7; av., 17·5.
Swansea, max., 59; av., 29·9.
Swindon, max., 28·5; av., 7·7.
Swinton and Mexborough, max., 80; av., 5.
Taunton, max., 50; av., 33.
Teignmouth, max., 45; av., 20.
Tendring Hundred Company (Walton-on-the-Naze), max., 25; av., 20·6.
Thirsk, av., 33·3.
Tonbridge, max., 53; av., 51·6.
Torquay, max., 37·3; av., 16·7.
Tottenham, max., 64; av., 27.
Trowbridge (British Gas Light), max., 25·7; av., 11·8.
Tunbridge Wells, max., 65·1; av., 42.
Uxbridge, Maidenhead, and Wycombe, max., 70; av., 53·6.
Wakefield, max., 31; av., 13·3.
Waltham and Cheshunt, max.. 43; av., 36.
Ware, max., 60; av., 34·6.
Warrington, max., 32; av., 14·5.
Watford, max., 42·7; av., 30.
Wath, Bolton, and Thurnscoe, max., 82·6; av., 66·5.
Wellingborough, max., 65; av., 52.
Wellington (Salop), max., 35; av., 30·3.
Westgate and Birchington, max., 48; av., 38·3.
Weston-super-Mare, max., 53·6; av., 19·5.
Weymouth, max., 40; av., 27·5.
Willenhall, max., 25·3; av., 5.
Winchester, max., 55; av., 42.
Woking, max., 25; av., 14·1.
Wokingham, max., 47; av., 39.
Wolverhampton, max., 61·4; av., 32·4.
Worthing, max., 29·1; av., 10·6.
Yeadon and Guiseley, max., 35; av., 25.
York, max., 39·5; av., 10·9.

Airdrie, max., 60; av., 46.
Ardrossan, max., 33·3; av., 25.
Blantyre, av., 33·3.
Burntisland, max., 30; av., 30.
Edinburgh, max., 33·1; av., 11·1.
Greenock, max., 54·3; av., 26·9.
Kilmarnock, max., 40; av., 37·8.
Kirkintilloch, max., 55; av., 50.
Largs, max., 50; av., 50.
Newport (N.B.), max., 40·6; av., 32·6.
Stirling, max., 50·2; av., 44·2.
Tayport, max., 40; av., 25.

OTHER GAS.

Of the 4,453,446,000 c.ft. of "other gas" produced by the various undertakings in 1927, the South Staffordshire Mond Gas Company were responsible for 3,123,359,000 c.ft. The output of the Mond Gas Company in 1926 was 3,175,745,000 c.ft. The remainder of the "other gas" was largely made up of Tully gas and mixed coal and water gas. The total of gas made shown in the return, of course, includes this "other gas" which is additional to the items of "coal gas" and "water gas."

GAS IN BULK.

The usual tables are included which show the gas sold in bulk to authorized gas undertakings by other undertakings, and that similarly bought by undertakings. The figures are included only once in the return—*i.e.*, as made by the selling undertaking, and as sold to consumers by the purchasing undertaking. The gas so sold amounted to 750,007,000 c.ft.; while the purchases totalled 719,558,000 c.ft. The biggest figures in these tables are:

Gas Sold to Authorized Undertakings.

Selling Undertaking.	C.Ft.
Birmingham Corporation	20,082,000
Hull (British Gas Light Company, Ltd.)	67,591,000
Otley Gas Company	21,845,000
Rhymney and Aber Gas Company	55,437,000
Watford Gas and Coke Company	115,261,000
Windsor Royal Gaslight Company	27,458,000
Bothwell and Uddingston Undertaking (Lanark County Council)	253,849,000
Cambuslang Undertaking (Lanark County Council)	47,791,000

Gas Bought by Authorized Undertakings.

Purchasing Undertaking.	C.Ft.
Bedwellty U.D.C.	55,436,000
Burley-in-Wharfedale U.D.C.	21,845,000
Hull Corporation	67,591,000
Mynyddislwyn U.D.C.	24,530,000
Rickmansworth U.D.C.	80,225,000
Solihull Gas Company	20,082,000
Uxbridge, Maidenhead, Wycombe, and District Gas Company	62,390,000
Bellshill and Mossend Undertaking (Lanark County Council)	81,027,000
Blantyre Undertaking (Lanark County Council)	27,115,000
Holytown, New Stevenston, and Carfin Undertaking (Lanark County Council)	33,360,000
Larkhall Undertaking (Lanark County Council)	87,614,000

COKE OVEN GAS SUPPLIES.

The following quantities of gas were bought from owners of coke ovens by authorized gas undertakings, and appear in the return as sold to consumers by those undertakings:

Purchasing Undertaking.	Quantity of Gas Involved.
	C.Ft.
Castleford and Whitwood Gaslight and Coke Company	145,900,000
Chesterfield Corporation	121,737,000
Dinnington and District Gas Company, Ltd.	52,121,000
Eckington and Mosborough Gas Company, Ltd.	37,000,000
Houghton-le-Spring District Gas Company	48,815,000
Kidsgrove Gaslight Company	49,791,000
Leeds Corporation	298,765,000
Little Hulton U.D.C.	21,394,000
Middlesbrough Corporation	1,046,811,000
Ossett Corporation	147,207,000
Pontypridd U.D.C.	145,507,000
Port Talbot Corporation	85,050,000
Rawmarsh U.D.C.	73,155,000
Redcar Corporation	27,982,000
Rhymney and Aber Gas Company	283,720,000
Rotherham Corporation	365,236,000
Sheffield Gas Company	1,856,560,000
Staveley Gas Light and Coke Company	12,405,000
Stocksbridge Gas Company	35,821,000
Swinton and Mexborough Gas Board	70,769,000
Wath, Bolton, and Thurnscoe Gas Board	106,709,000
Wombwell U.D.C.	78,914,000
Worsbrough-Dale and Worsbrough Gas Light and Coke Company, Ltd.	18,037,000
Glasgow Corporation	210,817,000
Total	5,340,223,000

The total compares with a figure of 2,321,850,000 c.ft. of coke oven gas purchased by gas undertakings in 1926 (which year was, of course, affected by the coal strike), 4,797,752,000 c.ft. in 1925, 4,470,914,000 c.ft. in 1924, 4,268,055,000 c.ft. in 1923, 3,635,678,000 c.ft. in 1922, and 1,325,027,000 c.ft. in 1921. There are on the present occasion two names added to the list of purchasing undertakings—those of the Rawmarsh Urban District Council and of the Redcar Corporation. On the other hand, the Manchester Corporation is removed from the list.

Road and Traffic Signs.—At a conference held at the Institution of Mechanical Engineers on July 24, called by the British Engineering Standards Association at the request of the Association of Public Lighting Engineers, the question of standardization of the signs and signals for erection on roads was considered. While the conference did not feel that the time was yet ripe to recommend the setting-up of a committee for this purpose, the "B.E.S.A." were asked to call them together again in about six months' time, to consider the matter further. Lieut.-Colonel K. Edgcumbe, the Chairman of the conference, explained that the object to be achieved by setting-up a committee of the "B.E.S.A." would be to provide a clearing-house for particulars of all the experimental work, with a view to agreed standard forms being published eventually.

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

Education Scheme: Midland District Gas Education Committee.

SIR,—May I take advantage of your correspondence columns to remind junior members of the staffs of gas undertakings situated in the Midlands District that studies for the various examinations under The Institution of Gas Engineers' Education Scheme have to commence in September.

This Committee will be glad to hear from any potential student who may have difficulties with regard to the course of study he has to pursue, and are also prepared to give advice either on subjects to be studied, or on technical institutions at which necessary instruction can be obtained.

The Committee also invite the co-operation of gas engineers and managers in bringing the above paragraph to the notice of any officials under their control who may be considering a course of study, or who, in their opinion, might benefit from undertaking such a course of study.

During last session the Committee met regularly, and were instrumental in assisting many students and potential students over difficulties with regard to their courses of study.

H. R. HEMS,
Hon. Secretary,
Midland District Gas Education Committee.

Industrial Heating Section,
Gas Department,
Council House,
Birmingham,
July 28, 1928.

REGISTER OF PATENTS.

Meters.—No. 292,780.

METROPOLITAN GAS METERS, LTD., and FORSTER, J. D., both of Nottingham.

No. 17,988; July 6, 1927.

This invention has for its object to provide means whereby the capacity of a dry meter is increased. To this end the patentees superimpose upon the usual passage below the valve plate an auxiliary passage or chamber; the said chamber or passage registering with the whole or part of the length of the usual passage, which is located beneath the valve plate. The resulting gas passage is thus situated partly below and partly above the valve plate.

Prepayment Meters.—No. 292,821.

STAPLES, C. W., of Balham, S.W. 17, and GLOVER, G., & CO., LTD., of Chelsea, S.W. 3.

No. 26,660; Oct. 8, 1927.

The patentees point out that in prepayment meters it is already known to provide a plate, for opening and closing the valve, extending from a sleeve carried between shoulders on a spindle, movable to and fro in an axial direction alternately by the coin receiving mechanism and the meter mechanism, the said plate having a bar extending therefrom below the lever of the gas valve. According to this invention, the spindle passes through a nut rotatably mounted in a frame plate having a slot formed therein to provide a guide for the bar. The upper surface of this bar may be provided with a notch in which a pin extending from the gas valve lever can fall to allow the gas valve to close; the definite closing of the valve being ensured by an edge of the notch thrusting against the valve. When the bar is moved so that the notch is carried away from beneath the pin, the latter rests upon the upper edge of the bar, maintaining the valve in its open position.

In an alternative arrangement, the bar may be provided with a pin supporting the gas valve lever which may extend through a fork in the plate supporting the bar; the lever having a notch formed therein engaging the pin to effect the opening and closing of the valve.

Gasholder Plates.—No. 292,861.

MILES, T. V., and NEWTON, CHAMBERS, & CO., LTD., both of Thorncliffe.

No. 153; Jan. 3, 1928.

The patentees remark that it has long been recognized by some metallurgists that the presence of copper in steel leads, in a general way, to an increased resistance to atmospheric or salt-water corrosion in steel sheets, plates, or bars; and as a result of experiments and tests the patentees find that by constructing gasholders of steel or iron containing a percentage of copper the life of the constructional parts is greatly increased, and the general corrosion and destructive effects of the gases, condensation, or deposited products, and of the contaminated water seals, are to a great extent obviated. Accordingly, the present invention is to construct gasholders of a metal or alloy consisting of a mixture of steel or iron with a percentage, preferably a small percentage, of copper. Good results are obtained by employing a metal or alloy of steel containing copper to the extent of not less than 0·1 p.ct. and not more than 3·5 p.ct. suitably alloyed therewith.

Gas Wash-Boilers.—No. 292,857.

DEAN, W., of Whalley.

No. 34,779; Dec. 22, 1927.

The patentee remarks that hitherto it has been the practice to arrange the burners of gas wash-boilers in fixed relation to the bottom of the pans or boilers proper, with the result that in districts where a good supply and pressure of gas are available, the flames from the burner are too long, and with excessive pressure are dangerous, and at the same time damage the outer casing, and in districts where the supply and pressure are poor, the flames are not sufficiently long to be efficient.

Accordingly, the burner of a boiler is by the invention adapted to be moved towards or away from the pan or boiler proper by a member operable by a single operation.

In a suitable arrangement for carrying out the invention, the burner, which is of the usual ring form, is supported centrally beneath the pan by an upright screw through a bracket supported by the outer casing of the boiler through the medium of a series of arms; the screw being rotatably connected to the burner and being provided with a winged head to enable it to be rotated by hand. A lock-nut may be employed to secure the screw in any position. The hole in the outer casing of the wash-boiler through which the inlet branch or pipe of the burner passes is elongated to allow the inlet pipe to rise and fall by the adjustment of the burner by the screw.

Steaming Vertical Retorts.—No. 293,160.

COE, A., of Halifax.

No. 12,978; May 14, 1927.

This invention consists in a system for supplying steam to a number of gas retorts or the like, in which each of the retorts is individually controlled by a loosely-fitted readily interchangeable calibrated throttling device in the service pipe to each retort, in combination with a regulating or control valve provided with an indicator on the steam supply main, whereby any variation is immediately shown upon the calibrated dial of the indicator. Thus a predetermined flow of steam may be maintained constant at any point, and an exact control of the quantity of steam by weight admitted is obtained, in order that the quality as well as quantity of gas produced by the whole installation may remain approximately constant also.

The invention is very fully described and illustrated in the complete specification, and there are nine claims, of which the following extracts indicate the main features of the invention.

The throttling device in the service pipe to each retort comprises a loose interchangeable nipple provided with a bore of a predetermined diameter adapted to be held in engagement with a seating formed by a recess in a hollow casting screwing on to the said service pipe; and the orifice or outlet of the interchangeable calibrated throttling device or nipple is formed in a wear-resisting bush forming a part thereof.

The regulating or control valve on the steam supply main is provided with means adapted to indicate any interference with the flow of steam to the service pipes to the retorts, or the backing-up of pressure in the steam supply main; and means are provided upon the control valve and upon the indicator, whereby each adjustment thereof is prevented from being interfered with by an unauthorized person.

The indicator or pressure gauge connected with the control valve embodies a Bourdon tube, and is also provided with scales calibrated and adapted to be associated with a calibrated throttling device in the service pipe to each retort, a steam pressure operated pointer, and one or more red or other suitably coloured hand operated pointers.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for July 18.]

Nos. 19,828—20,543.

BRITISH THOMSON-HOUSTON COMPANY, LTD.—"Gas compressors." No. 20,229.

GAS LIGHT AND COKE COMPANY.—"Metallic jointing means." No. 20,336.

GIMPLE, G.—"Gas meters." No. 20,267.

HODGSON, J. L.—"Flow meters." No. 19,993.

LUTZ, A.—See Gimple, G. No. 20,267.

SCHUH, E.—See Gimple, G. No. 20,267.

SIMMONS, R. A.—"Attachment for actuating gas taps." No. 19,924.

SINNATT, F. S.—"Treatment of coal." No. 20,077.

SPENCER, F.—See Gas Light and Coke Company. No. 20,336.

WEST, E., and WEST'S GAS IMPROVEMENT COMPANY, LTD.—"Vertical retorts." No. 19,054.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

Progress of Bills.

Dover Gas Bill: Returned from the Commons, agreed to, with amendments. The Commons amendments were considered, and approved.

Bollington, Maryport, and Shirebrook and District Gas Orders: Approved.

HOUSE OF COMMONS.

Progress of Bills.

Blackpool Improvement Bill: As amended, considered; read the third time, and passed, with amendments.

Bollington, Bourne, British Gas Light (Hull), Dursley, Lincoln, Maryport, Shirebrook and District, Worksop, and Wrexham Gas Orders: Agreed to.

Oil Extraction.

Mr. JOHNSTON asked, on July 19, the Prime Minister, whether he was aware that foreign coal interests were negotiating for the exclusive rights of a low-carbonization process, for the extraction of oil from coal and the manufacture of smokeless fuel, invented by Mr. Charles Turner and now in experimental operation at Coalburn, Lanarkshire; and whether, in the national interest, he would have immediate inquiries made with a view to the retention of this process in British hands?

The SECRETARY FOR MINES (Commodore Douglas King), who replied to the question, said that the Government had no knowledge of the negotiations mentioned; but the Fuel Research Board were aware of the nature of the process, and there appeared to be no reason in the national interest to interfere with the owner's freedom to dispose of his rights in it as he considered fit.

RATING AND VALUATION (APPORTIONMENT) BILL.

The second reading of this Bill was moved in the House of Lords on July 24 by Viscount PEEL. After giving a sketch of the machinery for carrying out some of the provisions of the Bill, his Lordship gave definitions of what were agricultural, industrial, and freight transport hereditaments. Regarding industrial hereditaments, he said, it was easy in theory to distinguish very definitely between the process of production and the process of distribution. But it was not so easy in practice, as they were apt to be mingled together. Public supply undertakings were not included in the derating scheme; and about this he would like to say a word. The principle of the whole scheme was that the relief, or the money available for relief, should be applied in a manner best calculated to assist industry and employment. In the case of the industries, the relief was fairly certain to get through to the consumer, and particularly to assist the export trade. Public supply undertakings—gas, electricity, and so on—were mostly monopolies, and there was no security that if they were derated the relief would go directly to the industry. In fact, it was probable that, instead of being concentrated, the relief would be spread over the whole body of ratepayers in the locality, and therefore be wasted to some extent for the specific purpose for which the scheme was devised. If these hereditaments came within the definitions and at the same time were primarily used for industrial purposes, another question arose, because many parts, or some parts at any rate, of the industrial hereditaments were not concerned with the actual processes of manufacture, and therefore there was no reason why, under the general scheme, they should be derated.

Lord PARMOOR, who moved as an amendment "that the Bill be read a second time this day six months," said that the first point regarding the subsidy principle was whether it was properly applied or not. Viscount Peel had called attention to prosperous and unprosperous businesses. The fact that a distinction had to be drawn was, in his view, a condemnation of the proposals of the Bill as a subsidy measure. The scheme would give thousands of pounds to industries which were extremely prosperous at the present time, which were earning large dividends, and which on any principle should not have any State subsidy. The chemical industry, for instance, was an extremely prosperous one. Would anyone in the House say it was right to give out of national funds a subsidy or gift of £600,000 to this prosperous industry? It condemned the proposition; it showed that the scheme was made on a wrong footing. Coming to public supply undertakings, Lord Parmoor remarked that they were not to have the benefit of the subsidy given under the Bill. Why, he asked, penalize industrial undertakings of a beneficial character merely because they were in the hands of municipalities or other public bodies?

The amendment was lost; and the Bill read a second time.

Radiation, Ltd.

In last week's "JOURNAL," it was mentioned that on July 18, Mr. A. V. Alexander asked the President of the Board of Trade upon what grounds an application for an investigation into the affairs of Radiation, Ltd., under Section 109 of the Companies Act, 1908, had been refused by the Board of Trade. The reply of Mr. H. Williams (Parliamentary Secretary of the Board of Trade) was given, and in this an unaccountable error occurred between one stage and another of passing the proofs. It was stated: "After careful consideration of the whole circumstances, the Board of Trade came to the conclusion that the case was not one in which they ought to exercise their powers." Unfortunately the "not" did not appear in the published page of the "JOURNAL," though our readers would gather from the context that its inclusion was essential to Mr. Williams' reply.

MISCELLANEOUS NEWS.

INSTITUTION OF CHEMICAL ENGINEERS.

Examination for Associate-Membership.

We have received from Prof. J. W. Hinchley, the Hon. Secretary of the Institution of Chemical Engineers, a copy of the papers set for the 1928 Associate-Membership examination held in April, May, and June. As examples of the type of questions set, we quote the following:

The following data were obtained during a test on a gas-fired boiler:

Analysis of Original Fuel Gas.

	P.Ct. by Volume.
CO_2	2·1
O_2	0·8
CO	13·8
H_2	41·3
CH_4	22·9
N_2	15·0
Illuminants	4·1

Analysis of Flue Gas.

	P.Ct. by Volume.
CO_2	5·9
O_2	8·0
CO	1·9
N_2	84·2

Average steam pressure in boiler	= 100 lbs. per sq. in. gauge.
Feed water temperature	= 17·4° C.
Gas passed at meter	= 10,550 c.ft.
Pressure of gas at meter	= 4 in. water gauge.
Temperature of gas at meter	= 14·6° C.
Reading of barometer	= 765 mm. Hg.
Vapour pressure of water at 14·6° C.	= 12·35 mm. Hg.
Water evaporated	= 2300 lbs.
Lower (net) calorific value of gas	= 420 B.Th.U. per c.ft., measured at 760 mm. and 14·6° C.

Estimate (i) percentage excess air.
(ii) net thermal efficiency of the boiler.

State what system of control you would institute to determine the efficiency of a large steam generation unit, where it is proposed to use coke breeze as fuel. Describe the arrangements you would make to determine accurately the following:

(1) The chemical efficiency of:
  (*a*) Permanent softening.
  (*b*) Temporary softening.
(2) Thermal efficiency of a boiler installation.
(3) Thermal loss due to:
  (*a*) Combustible matter in clinker.
  (*b*) Flue gases.

Prepare a form of cost sheet for a tar distillation works, so arranged that the cost of production of:

(1) Pure benzene;
(2) Pitch;
(3) Creosote oil;
(4) Naphthalene

is clearly shown.

What are the essential considerations in preparing such a cost sheet?

LEEDS GAS UNDERTAKING REPORT.

In their report to the City Council, the Leeds Gas Committee state that the gross revenue for the year ended March 31 amounted to £833,980, and the expenditure to £617,150, leaving a gross profit of £216,830. After deducting income-tax, loan charges, and contributions to capital, a profit remains on the year's working of £33,628.

The quantity of gas made was 3,394,333,000 c.ft., as compared with 3,495,589,000 c.ft. during the previous year—a decrease of 101,256,000 c.ft., or 2·8 p.ct. This includes 337,242,000 c.ft. of coke oven gas received from the Middleton Estate and Colliery Company, which was an increase of 250,988,000 c.ft. The quantity of carburetted water gas produced was 272 millions, as compared with 691 million c.ft. in 1926-27, a decrease of 419 millions. In the previous year, this plant was running at full capacity during the period of the coal stoppage. The total quantity of gas sold was

3,196,797,000 c.ft., compared with 3,302,868,000 c.ft. the previous year—a decrease of 106,071,000 c.ft., or 3·2 p.ct.

The number of ordinary meters in use on March 31 was 61,828, compared with 63,370 for the preceding year—a decrease of 1542. The number of prepayment meters in use on the same date was 72,318, compared with 66,098—an increase of 6220, making a net increase of 4678. Included in this number are 1886 meters which were taken over from the added areas of Crossgates and Horsforth. The total number of meters in use was 134,146. There was a net increase of 4987 gas cooking appliances; and during the year there has been a steady demand for heating appliances. There has been a regular demand for furnaces and apparatus for industrial work; the number of appliances sold being 185, against 180 the previous year. The number of bakers, confectioners, and fish fryers using gas has been greatly extended, while the total number of consumers on special furnace rate is 845, against 760 the previous year. The number of gas engines in use at the end of the year was 329, compared with 366 the previous year. The total length of mains in the area of supply is now 1134 miles, which is the greatest mileage in the kingdom, except London, Glasgow, and Birmingham.

The price of gas was reduced from the last meter reading in March, 1927, to 4s. 5d. per 1000 c.ft., or 11·28d. per therm; and a further reduction was made in September to 4s. 2d. per 1000 c.ft., or 10·64d. per therm. The average price received, after providing for discount and leakages, was 4s. 0·14d. per 1000 c.ft.

In accordance with the provision of the Leeds Corporation Gas Act, 1927, the Crossgates, Halton, and Seacroft Gas Company, was taken over on Jan. 1, 1928, at a cost of £56,819. The Committee decided to cease the manufacture of gas at these works, and resolved to connect the whole area to the Leeds mains. A survey of the district, however, proved that the mains and services were totally inadequate to maintain a sufficient supply of gas to the consumers. It was therefore recognized that the only solution to this question was to relay and enlarge practically the whole of the mains and services in the area; and the bulk of this work has been completed.

Every effort has been made during the year to bring before the public the advantage of cooking and heating by gas; and much interest was created by a stand erected by the Department at the "Leeds Mercury" Better Housing Exhibition held in the Drill Hall, Fenton Street. In the added areas of Crossgates, Halton, and Seacroft Gas Company, a showroom was opened in Austhorpe Road, where, in addition to a good display of gas apparatus, cookery demonstrations are being held weekly, and are very much appreciated. During the year a system of inspection of consumers' fittings has been adopted, when it was found that 75 p.ct. of the appliances installed were not properly adjusted, consequently being incapable of satisfactory service. This system is very much appreciated, and must inevitably increase the consumption of gas for domestic purposes.

The total number of street lamps in the city is 18,254, of which 17,371 are gas and 883 electric. During the year, 263 additional lamps have been erected in various parts of the city, and a further 2377 clock controllers have been fitted to existing lamps, of which 580 were in place of the pressure-wave type. The total number of lamps now lighted and extinguished automatically is 14,333.

GAS REGULATION ACT APPLICATIONS.

SPECIAL ORDERS.

Barnard Castle Gas Company.

To authorize the Company to acquire additional land for gas purposes, to raise further capital, &c.

Town of Dudley Gas Light Company.

To change the name of the Company; to extend the limits of supply and define the price chargeable in the added area; to authorize the acquisition of additional land and the raising of further capital; and to permit of the establishment of a profit-sharing scheme.

Rochdale Corporation.

To empower the Corporation to purchase the undertakings of the Whitworth Vale Gas Company and of the Milnrow Gas Company; to make provision as to the maximum price chargeable for gas; and to authorize the Corporation to borrow further money.

Southport Corporation.

To empower the Company to use scheduled land for the purposes of their undertaking.

Stockport Corporation.

To empower the Corporation to acquire the portion within the Parish of Woodford of the undertaking of the Wilmslow and Alderley Edge Gas Company; to enable them to use scheduled lands for gas purposes; to substitute the thermal for the volume basis of charge; and to authorize the borrowing of further money.

Tunbridge Wells Gas Company.

To enable the Company to acquire the undertaking of the Crowborough District Gas and Electricity Company; to extend the limits of supply; to authorize the charging of differential prices; to empower them to use scheduled land for gas purposes and to raise further capital; to make provisions for profit-sharing; and "to authorize the Company to make agreements with authorized gas undertakers in relation to the use or benefit of the Company's plant or organization, the provision of moneys, and any matters affecting or incidental to the manufacture and sale of gas or residual products, and to contract with any local authority, company, or person, whether within or beyond the limits of supply, for the supply of gas to each other."

BRISTOL GAS COMPANY'S EMPLOYEES.

Long Service Pensions.

About fifty old employees of the Bristol Gas Company assembled at the invitation of the Directors in the Board Room at the Head Office on July 24. For some years past the Company have had in force a non-contributory pension scheme, but last year they decided to present to all the old employees certificates (illuminated and framed), setting forth the number of years they had been employed. In September last year the total number was 45. Since then eleven more have qualified for their pensions, and the certificates were presented on July 24. Sir George Davies (Chairman of the Company) presided, and with him were Lady Davies, Alderman Fuller Eberle (Vice-Chairman of the Company), Mr. F. C. Burgess (a Director), Mr. S. E. Halliwell (Secretary), and Mr. R. Robertson (Engineer).

Sir GEORGE DAVIES, after expressing a hearty welcome to the guests, said that the Directors valued the good feeling and good fellowship which had always existed between the Company and their employees. The Directors had been able to fulfil the responsibilities resting upon them largely in consequence of the fact that everyone concerned in the work had done his best. One of the factors which had contributed to that happy position was the fact that the Directors had desired at all times that they would not cast off old workers, but had a non-contributory scheme by which a moderate provision was made for the men when they reached the period of old age.

Lady DAVIES then presented the certificates, following which the men were entertained at tea.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *July* 30.

It is reported that quite fair quantities of pitch have been sold during the last week at prices ranging from 52s. 6d. to 55s. per ton. It would therefore appear that buyers consider that there is not likely to be a further fall.

Creosote is reported to have been sold at 7¾d. per gallon f.o.b., and is steady at this figure.

White spirits remain unchanged.

Tar Products in the Provinces.

July 30.

There is nothing of interest to report in the market for tar products.

There is still a fair amount of inquiry for pitch from the Continent, and some business has been done at round about 52s. 6d. f.o.b.

Creosote is quiet; but there is still a fair demand.

The firmness in water-white products continues, and there is no desire on the part of makers to sell.

Crude carbolic continues quiet. Crystals carbolic is in poor demand.

Cresylic acid is steady, and there is still a fair amount of demand for the best quality; but inferior grades remain difficult of sale.

The average prices of gas-works products during the week were: Gas-works tar, 35s. to 40s. Pitch—East Coast, 50s. to 52s. 6d. f.o.b. West Coast—Manchester, 44s. to 45s.; Liverpool, 46s. to 47s. 6d.; Clyde, 45s. to 47s. 6d. Toluole, naked, North, 1s. 5d. to 1s. 6d. nominal. Coal-tar crude naphtha, in bulk, North, 9d. to 10d. Solvent naphtha, naked, North, 1s. 1½d. to 1s. 2d. Heavy naphtha, North, 1s. to 1s. 0½d. Creosote, in bulk, North, liquid, 6d. to 6½d.; salty, 5¾d. to 6¼d.; Scotland, 5¾d. to 6½d. Heavy oils, in bulk, North, 8½d. to 8¾d. Carbolic acid, 60 p.ct., 2s. 2d. to 2s. 2½d. prompt. Naphthalene, £13 to £15; salts, £5 to £5 10s., bags included. Anthracene, "A" quality, 2½d. per minimum 40 p.ct., purely nominal; "B" quality, unsaleable.

Benzole Prices.

The following are considered to be the market prices to-day:

	s. d.	s. d.	
Crude benzole	0 10½	to 0 11	per gallon at works
Motor "	1 4½	" 1 5	" " "
90 p.ct. "	1 7	" 1 8	" " "
Pure "	1 10	" 1 11	" " "

Lea Bridge District Gas Company.—The Directors have declared a dividend for the half-year ended June 30 last at the rate of 7½ p.ct. per annum, on the consolidated ordinary stock of the Company, payable on Sept. 1 next, less income-tax. The price of gas to ordinary consumers was reduced, as from the reading of the indices at the Midsummer quarter, to 8·6d. per therm.

Manchester Gas Department's Administration.—Notice of the following resolution for the meeting of the Manchester City Council to-day has been given by Councillor J. W. Sutton: That arising from recent incidents in connection with the Gas Committee a Special Committee (consisting of six members who are not members of the Gas Committee) be appointed to inquire into the administration of the Gas Department, and to present a report thereon to the Council.

Leeds Change to Hire-Purchase System.—The Gas Committee of the Leeds Corporation propose to make a change in the conditions on which gas appliances are supplied to customers. In future, they will be supplied on three or five years' hire purchase, in lieu of the present simple hire system. All appliances and fittings supplied with a prepayment meter will become the property of the consumer on completion of the payment of the cost, the payment to be made through the meter by means of an additional charge on the ordinary price of gas. Appliances already fixed on simple hire will become the property of the consumer on completion of ten years' hire and payment of fixing the appliances.

For Coal Trade Reports, Contracts Open, Trade Notes, and Miscellaneous Paragraphs see p. 272.

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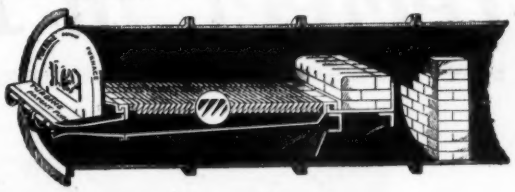

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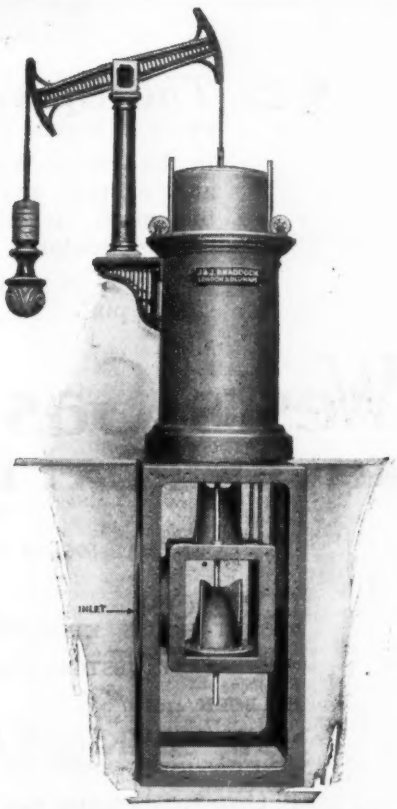

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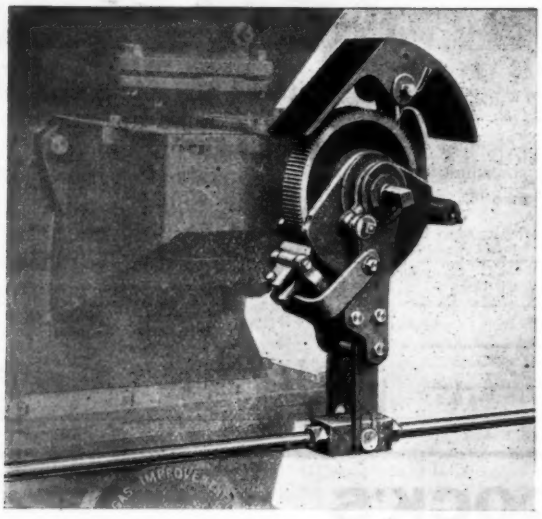

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STOCK MARKET REPORT.

THE stock markets closed quite cheerfully last week. A stimulating influence in the Home Rail Market was the relatively satisfactory railway dividends, which influence, assisted by the provisional wages agreement, brought about a general advancement of prices of all classes of ordinary stocks.

With one or two exceptions gilt-edged securities moved against holders; the market being affected by the weakness of the New York exchange, and Continental buying of gold. Industrials were undoubtedly brighter.

Business in the Gas Market was more prolific than usual. With a large number of standing orders in the hands of the brokers for the purchase of capital stocks, prices are likely to be maintained. It will be seen that there are many *ex* div. reductions; and it is noticeable that in the case of the Tottenham 5 p.ct., the fall on a 4 p.ct., actual dividend, was only 1 point. Apart from these variations, the Sheffield stocks and Imperial Continental ordinary were marked up 1 point, and there was a fall of 4½d. on the Newcastle £1 ordinary and of 1½ points on the South Shields consolidated, both at the local exchange. The South Metropolitan have announced an interim dividend of 2½ p.ct., being the same as last year.

The following transactions were recorded:

On Monday, Aldershot 4 p.ct. preference 72, Commercial 3 p.ct. debenture 58, Continental Union 33, 7 p.ct. preference 94, Croydon maximum dividend 86, Gas Light and Coke 19s. 3d., 19s. 6d., 19s. 6¾d., 3½ p.ct. maximum 65, 4 p.ct. preference 80, 3 p.ct. debenture 60⅜, Imperial Continental 168, 169, 170, Liverpool 7 p.ct. preference 104, 104½, Malta and Mediterranean 5½, Primitiva 23s. 3d., South Metropolitan 107, 107½, South Suburban 5 p.ct. 107½, Tottenham "A" 120, "B" 98, Uxbridge 5 p.ct. preference 90. Supplementary prices, Croydon 7 p.ct. debenture 103, Gas Light and Coke 5 p.ct. debenture 1952-57 100¼, Malta and Mediterranean second 7⅛ p.ct. preference 5.

On Tuesday, Alliance and Dublin 94½, Bournemouth 3 p.ct. debenture 57, Commercial 100, 100¾, Continental Union 7 p.ct. preference 95½, Croydon sliding-scale 111⅜, European 8⅞, Gas Light and Coke 19s. 3d., 19s. 4½d., 19s. 5¼d., 19s. 6d., 3½ p.ct. maximum 64½, 65, 3 p.ct. debenture 60½, Hornsey 3½ p.ct. 83½, Malta and Mediterranean 5⅝, Primitiva 22s. 9d., South Metropolitan 108, 3 p.ct. debenture 60¾, South Suburban 5 p.ct. 107, Tottenham "B" 97½, 98½, Tuscan 20s., Uxbridge 5 p.ct. 94. Supplementary prices, Croydon 7 p.ct. debenture 104, Gas Light and Coke 5 p.ct. debenture 100½, 100¼, 100⅜, Malta and Mediterranean second 7⅛ p.ct. preference 5⅛, Romford 10 p.ct. 111½, 112, South Shields new 7 p.ct. 110, 110½, Southgate and District 7 p.ct. 108½, Swindon United 5 p.ct. 73½, 74.

On Wednesday, Alliance and Dublin 4 p.ct. debenture 64, Commercial 100¾, Croydon maximum dividend 87, European 8½, Gas Light and Coke 19s. 3d., 19s. 3¾d., 19s. 4½d., 19s. 6d., 19s. 7½d., 4 p.ct. preference 80, 3 p.ct. debenture 60½, 6 p.ct. Brentford debenture 103½, Imperial Continental 3½ p.ct. debenture 69, 70, Liverpool 7 p.ct. preference 104, Plymouth and Stonehouse 5 p.ct. 106, Primitiva 22s. 9d., 23s., 23s. 1½d., 23s. 3d., South Metropolitan 106¾, 107½, 3 p.ct. debenture 60, South Suburban 5 p.ct. 108, Tottenham "A" 120, "B" 98½. Supplementary prices, Gas Light and Coke 5 p.ct. debenture 1952-57 100½, Rochester, Chatham, 8 p.ct. debenture 101, Southend new "B" 86½, 87, 4 p.ct. debenture 74.

On Thursday, Alliance and Dublin 4 p.ct. debenture 65½, Bombay 22s. 10¾d., 23s. 1½d., British 115, 4 p.ct. debenture 76, Commercial 97½, *ex* div., Croydon sliding-scale 111½, 111⅝, European 8⅛, 8⅜, Gas Light and Coke 18s. 9d., 18s. 10½d., 19s., *ex* div., 3½ p.ct. maximum 62⅝ *ex* div., 4 p.ct. preference 78 *ex* div., Primitiva 22s. 6d., 23s. 1½d., 23s. 3d., South Metropolitan 106 *ex* div., Tottenham "A" 120, "B" 95¼. Supplementary prices, Gas Light and Coke 5 p.ct. debenture 1952-57 100¾, 100½, 101¼.

On Friday, Alliance and Dublin 93⅜, Continental Union 33, Gas Light and Coke 18s. 9d., 18s. 10½d., 18s. 11¼d., 19s., 3½ p.ct. maximum 62⅝, 3 p.ct. debenture 60, 5 p.ct. debenture 99, Imperial Continental 170, Primitiva 23s., South Suburban 5 p.ct. 108, Tottenham "B" 96. Supplementary prices, Danish 7⅛, 7⅝, Gas Light and Coke 5 p.ct. debenture 100½, 101¼, Southgate and District 7 p.ct. 107.

In Lombard Street the withdrawal of gold on German account caused the discount market to harden. Treasury Bill allotments were made at an average of £4 2s. 6·42d. p.ct., being practically 2s. 6d. p.ct. above the previous week's rate. Money was, however, as plentiful as usual, the charge for fresh accommodation declining from 3½ p.ct. to 2½ p.ct. Old loans were mostly renewed at 3½ p.ct.

On the Foreign Exchange Market the gold exchanges were generally steadier. The Berlin rate, however, fell slightly, closing at 20.34. French francs finished at 124.07½, and Dutch florins at 12.07⅞. Italian lire were quoted at 92.81½, and Belgas at 34.90⅜; pesetas being a shade higher at 29.52.

China was a heavy buyer of Silver, and the cash price rose to 27½d. per oz. Gold advanced ½d. to 84s. 11½d. per oz.

The Bank Rate is 4½ p.ct., to which it was reduced from 5 p.ct. on April 21, 1927. The Banks' deposit rate is 2½ p.ct., and the deposit rates of the discount houses are 2½ p.ct. at call and 2⅝ p.ct. at notice

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf.Yr	Dividends. Last Hf. Yr.	NAME.	Quotations. July 27.	Rise or Fall on Week.	Transactions Lowest and Highest Prices.
£			%p.a	% p.a.				
171,978	Stk.	Feb 9	5	5	Aldershot 5 p.c. max. C.	74—79	..	..
412,992	,,		4	4	Do. 4 p.c. Pref.	69—72	..	72
1,561,868	,,	Apl. 12	7	7	Alliance & Dublin Ord.	93—96	..	93⅜—94½
274,000	,,	July 12	4	4	Do. 4 p.c. Deb.	58—66	..	64—65½
523,554	,,	Mar. 8	7	7	Barnet Ord. 7 p.c.	109—112	..	..
300,000	1	Apl. 26	1/7½	1/7½	Bombay, Ltd.	121/—23/-	..	22/10½—23/1½
170,000	10	Mar 8	8½	8½	Bournemouth 5 p.c.	12½—13½	..	..
500,050	10	,,	7	7	Do. B 7 p.c.	12½—13½	..	..
375,000	10	,,	6	6	Do. Pref. 6 p.c.	11—11½	..	..
50,000	Stk	July 12	3	3	Do. 3 p.c. Deb.	56—59	..	57
162,025	,,	,,	4	4	Do. 4 p.c. Deb.	75—78	..	..
357,900	,,	Mar. 8	7½	7½	Brighton & Hove 6 p.c. Con.	116—119	..	..
341,880	,,	,,	6/8/6½	6½	Do. 5 p.c. Con.	103—106	..	..
1,327,500	,,	July 26	5	5	Bristol 5 p.c. max.	89—90a*	−2	..
885,000	,,	Mar. 22	8	7	British Ord.	113—116	..	115
100,000	,,	June 28	7	7	Do. 7 p.c. Pref.	111—114	..	..
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb.	73—76	..	76
200,000	,,	,,	5	5	Do. 5 p.c. Red. Deb.	94—97	..	..
100,000	10	May 24	8	8	Cape Town, Ltd.	7½—8½	..	..
100,000	10	Apl 26	4½	4½	Do. 4½ p.c. Pref.	6½—7½	..	..
150,000	Stk.	June 28	4½	4½	Do. 4½ p.c. Deb.	70—75	..	..
626,860	,,	July 26	6	6	Cardiff Con. Ord.	96—99*	−2	..
887,940	,,	June 28	7½	7½	Do. 7½ p.c. Red. Deb.	100—103	..	..
157,150	,,	Feb 23	6	6½	Chester 6 p.c. Ord.	88—93b	..	..
79,185	1	Apl. 26	†2/-	†2/-	Colombo Ltd. Ord.	31/—33/-	..	..
24,495	1	,,	1/4½	1/4½	Do. 7 p.c. Pref.	20/—23/-	..	..
375,402	1	Apl. 12	1/9½	1/9½	Colonial Gas Assn. Ld. Ord.	23/—25/-	..	..
187,848	1	,,	1/7½	1/7½	Do. 6 p.c. Pref.	21/—23/-	..	..
2,073,360	Stk.	July 26	7	5	Commercial Ord.	96—99*	−2	97½—100¾
475,000	,,	June 14	8	8	Do 3 p.c. Deb.	57—60	..	58
300,000	,,	Sept. 29	‡1	11	Continental Union, Ltd.	33—36	..	33
300,000	,,	Mar. 8	7	7	Do. 7 p.c. Pref.	92—97	+2	94—95½
787,560	,,	Mar. 8	6½	7	Croydon sliding scale	110—113	..	111½—111⅝
408,100	,,	,,	5	5	Do. max. div.	84—87	..	86—87
422,270	,,	Mar. 8	7	10	Derby Con.	115—130c	..	..
58,000	,,	June 28	4	4	Do. Deb.	71—78c	..	..
299,000	,,	Mar. 8	5	5	East Hull Ord. 5 p.c.	78—79	..	..
50,000	,,	June 28	5	5	Eastbourne 5 p.c. Deb.	91—96	..	..
1,002,180	10	Mar. 22	†4	†6	European, Ltd.	8—9	..	8⅛—8⅞
18,703,480	Stk.	July 26	5/1/4	5½	Gas Light & Coke 4 p.c. Ord.	18/9—19/3/*	−/7½	18/9—19/7½
2,600,000	,,	,,	8½	8½	Do. 8½ p.c. max.	61½—63½*	−1½	62½—65
4,187,020	,,	,,	4	4	Do. 4 p.c. Con. Pref.	77—80*	−1	78—80
5,202,620	,,	June 14	8	8	Do. 8 p.c. Con. Deb.	60—62	..	60—60½
181,315	,,	,,	6	6	Do. 6 p.c. Br'tf'd Rd. Db.	103—106	..	103½
1,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb.	99—101	..	99
42,000	,,	—	7½	7½	Do. 7½ p.c. Ilford Deb.	..	..	..
82,500	,,	Mar. 8	6½	6½	Hastings & St L. 5 p.c. Conv	90—95	..	..
268,740	,,	,,	5½	6½	Do. 8½ p.c. Conv.	70—75	..	..
70,000	10	Apl. 26	†10	†10	Hongkong & China, Ltd.	13½—14½	..	..
178,200	Stk.	Mar. 8	5	5	Hornsey Con. 3½ p.c.	83—85	..	83½
1,976,000	,,	May 24	10	10	Imperial Continental Cap.	166—171	+1	168—170
329,180	,,	Feb 9	8½	8½	Do. 3½ p.c. Red. Deb.	68—70	..	69—70
235,242	,,	Mar. 8	7	7	Lea Bridge 6 p.c. Ord.	94—97	..	..
2,145,907	,,	Feb. 23	5½	5½	Liverpool 5 p.c. Ord.	92—98b	..	..
600,000	,,	Mar 22	7	7	Do. 7 p.c. Red. Pref.	102—104b	..	..
165,786	,,	Feb. 23	9	8	Maidstone 5 p.c. Cap.	118—120	..	..
75,000	5	June 14	†8	†8	Malta & Mediterranean	5⅛—5⅜	..	5⅛—5⅜
841,920	Stk.	May 24	†5	†7	Montevideo, Ltd.	94½—96½	..	..
2,061,815	,,	Mar. 8	5	5	Newcastle & Gateshead Con.	16/3—17/-d/	−/4½	..
350,920	,,	,,	4	4	Do. 4 p.c. Pref.	74½—75½d	..	..
491,705	,,	June 28	8½	8½	Do. 8½ p.c. Deb.	65—66d	..	..
121,780	,,	Mar. 8	6/18/0	6/18/0	North Middlesex 6 p.c. Con.	98—101	..	..
900,000	,,	Apl. 26	9	7	Oriental, Ltd.	116—121	..	..
188,120	,,	June 28	7½	7½	Plym'th & Ston'house 5 p.c.	105—110	..	106
414,500	,,	Feb. 23	7½	7½	Portsm'th Con. Stk. 4 p.c. Std.	101—104	..	..
236,782	,,	,,	5	5	Do. 5 p.c. max.	77—80	..	..
2,334,464	1	—	—	—	Primitiva Ord.	22/6—23/6	..	22/6—23/3
244,500	100	June 1	4	4	Do. 4 p.c. Red. Deb.	91—94	..	..
695,000	Stk.	July 26	4	4	Do. 4 p.c. Red. Deb. 1911	76—78*	−1	..
416,845	,,	June 28	4	4	Do. 4 p.c. Cons. Deb.	75—77	..	..
150,000	10	Mar. 22	6	6	San Paulo 6 p.c. Pref.	82—84	..	..
270,000	Stk.	Mar. 22	6	6	Sheffield A	103—105e	+1	..
419,568	,,	,,	6	6	Do. B	103—105e	+1	..
1,047,000	,,	,,	6	6	Do. C	103—105e	+1	..
90,000	10	June 14	6	8	South African	4—6	..	..
6,609,895	Stk.	July 26	7½	5	South Met. Ord.	104—106*	−2	105—108
500,000	,,	,,	6	6	Do. 6 p.c. Irred. Pf.	108—111*	−2	..
1,895,445	,,	July 12	8	8	Do. 3 p.c. Deb.	58—61	..	60—60½
734,000	,,	Mar. 8	6½	6½	Do. 6½ p.c. Red. Db.	100—102	..	..
91,500	,,	Feb. 23	8½	8½	South Shields Con.	110—112d	−1½	..
1,245,795	,,	July 26	6½	6½	South Suburban Ord. 5 p.c.	104—107*	−2	107—108
368,837	,,	June 28	5	5	Do. 5 p.c. Deb.	96—99	..	..
647,740	,,	Mar. 22	5	5	South'mpton Ord. 5 p.c. max.	78—80	..	..
121,275	,,	June 28	4	4	Do. 4 p.c. Deb.	72—75	..	..
350,000	,,	Mar. 8	7	7	Swansea 7 p.c. Red. Pref.	100—103	..	..
300,000	,,	June 28	6½	6½	Do. 6½ p.c. Red. Deb.	99—102	..	..
120,000	,,	July 26	7½	8	Tottenham District A 5 p.c.	116—121*	−1	120
883,275	,,	,,	6½	6½	Do. B 3½ p.c.	95—98*	..	95½—98½
150,000	,,	,,	5½	5½	Do. 5½ p.c. Pref.	96—98*	−2	..
181,355	,,	June 14	4	4	Do. 4 p.c. Deb.	76—79	..	..
289,094	,,	Mar. 8	6½	6⅝	Uxbridge, Maidenhead, & Wycombe 5 p.c.	90—95	..	94
88,880	,,	,,	5	5	Do. 5 p.c. pref.	86—90	..	90
30,000	,,	July 12	8½	8½	Wandsworth, Wimbledon, and Epsom— Wandsworth A 5 p.c.	126—129	..	..
355,836	,,	,,	7	7½	Do. B 5½ p.c.	108—115	..	..
422,535	,,	,,	5/19/0	6½	Do. C and New	96—101	..	..
252,000	,,	,,	6⅝	6⅝	Do. Wimbledon 5 p.c.	104—109	..	..
98,000	,,	,,	7⅛	7⅛	Do. Epsom 5 p.c.	110—115	..	..
200,000	,,	,,	5	5	Do. 5 p.c. Pref	85—88	..	..
88,416	,,	June 28	8	8	Do. 8 p.c. Deb.	56—59	..	..
284,743	,,	,,	4	4	Do. 4 p.c. Deb.	75—78	..	..

Quotations at:—a.—Bristol. b.—Liverpool. c.—Nottingham. d.—Newcastle. e.—Sheffield. f.—The quotation is per £1 of Stock. * Ex. div † Paid free of income-tax. ‡ For year.

COAL TRADE REPORTS.

From Our Own Correspondents.

NORTH-EAST COAST.

The market remains dull, and for almost all classes of coal the volume of business obtainable is inadequate. The Government proposals to give relief in railway rates from next December have had little effect. They are still too vague in many details to be fully discussed, and there are obvious difficulties which will have to be elucidated. It is generally assumed that the benefit is unlikely to cover the present loss per ton in this district, even if current selling prices are maintained. It appears, however, that the object is to induce more business, presumably by offering at lower prices, and in this way to reduce production costs, and give more regular employment.

Current trading is very quiet; but, among better-class collieries, there is a certain amount of business being done for next year. Wear Special gas coals are quoted at 15s. 6d., and best qualities round 14s. 9d. f.o.b. Seconds are from 13s. to 13s. 6d. Coking coals are in slow demand, and are quoted at 13s. to 13s. 6d. for unscreened sorts. Best Durham unscreened steam are 14s. 3d. for cargo or bunkers; other qualities being 13s. to 13s. 9d. These prices are in nearly all cases maintained by the selling agreement, and there is a good deal of idle time.

The gas coke market is quiet but steady, and 20s. f.o.b. is asked for August shipment, and 21s. for further ahead.

YORKSHIRE AND LANCASHIRE.

Gas coals are not being taken in accordance with contracts. Deliveries, therefore, are spasmodic, although the indications are that forward business will be at rather higher figures.

The industrial market does not move in the direction anticipated, and values are easy at the moment.

The condition of the export market is considered satisfactory under the operation of the Five Counties Scheme.

Domestic coal rules on the quiet side, with prices fairly steady and discounted figures for "spot" lots.

The following are the Humber bunker and export prices, f.o.b. usual shipping ports:

South Yorkshire—Hards, Association, 17s. 6d. to 17s. 9d. bunkers, 14s. 9d. to 15s. export; screened gas coal, 14s. to 15s. 6d.; washed trebles, 14s. 6d. to 15s.; washed doubles, 14s. 3d. to 14s. 6d.; washed singles, 13s. 6d. to 14s. export; washed smalls, 12s. 6d. to 13s. bunkers, 10s. 6d. export; rough slack, 11s. 6d. to 11s. 9d. bunkers; smithy peas, 16s. 6d. to 17s. 6d. export.

West Yorkshire—Hartley's (f.o.b. Goole), 13s. 3d. to 13s. 9d.; screened gas coal, 14s.; washed trebles, 14s. 3d. to 15s.; washed doubles, 13s. 6d. to 13s. 9d.; washed singles, 13s. to 13s. 9d.; washed smalls, 10s.; unwashed trebles, 14s.; unwashed doubles, 11s. to 11s. 3d.; rough slack, 8s. 9d. to 9s. 3d.; coking smalls, 7s. 9d. to 8s. 9d. export.

Derbyshire and Nottinghamshire—Top hards, 16s. 6d. to 17s. 6d. bunkers, 14s. 6d. to 15s. 6d. export; cobbles, 13s. 6d. to 15s.; washed trebles, 14s. 3d. to 15s.; washed doubles, 14s.; washed singles, 13s. 6d. export; washed smalls, 12s. 6d. bunkers, 10s. 6d. export; unwashed doubles, 11s. to 12s. export; rough slack, 11s. 6d. to 11s. 9d. bunkers, 9s. to 9s. 6d. export.

Yorkshire, Derbyshire, and Nottinghamshire—Screened steam coal, 15s. to 16s. bunkers, 12s. to 13s. 3d. export; gas coke, 20s. to 23s.; furnace coke, 18s. 6d. to 19s. 6d. export; washed steam, 15s. 9d. to 16s. 3d. bunkers, all per ton.

MIDLANDS.

The Midland coal trade sees no immediate escape from the depression which has reigned so long. This, of course, is not the time to look for improvement; but the summer languor, no doubt to some extent on account of the heat wave, seems to be accentuated by comparison with recent years. Apart from a few sales for stocking purposes—and these are now greatly curtailed owing to the approach of the holidays—the domestic fuel branch is stagnant. Summer prices prevail; and rather than give way further, the policy of colliery proprietors is to reduce output to a minimum. Hence it is that few of the pits are working more than four days, and the majority are doing less. Even so, it is no easy matter to find outlets for the output.

City merchants experience no demand, and the yard and hawking trade has been temporarily killed by the hot weather. Nor are the industrial branches active, though there is always a steady flow of business. It is mostly of a hand-to-mouth character, however, and this state of affairs may be expected to continue until September.

The production of slacks is severely curtailed by reason of the small amount of coal being got up, so that while supply is fully equal to demand there is no superabundance. D.S. nuts and beans, too, are fairly normal, and only in isolated cases have excessive stocks been allowed to accumulate.

Both furnace coke and gas coke move slowly, and stocks are ample. Prices are unaltered on the week.

CONTRACTS OPEN.

Coal.

The Colwyn Bay Urban District Council invite tenders for the supply of gas coal. [See advert. on p. 274.]

Great interest was taken in the annual athletic sports held under the auspices of the Cardiff Gas Company's Employees' Athletic Club, at the Company's athletic grounds, Grangetown. Those present included Mr. Lawrence G. Williams (Chairman of the Company), who distributed the prizes in the evening.

TRADE NOTES.

Celite Products Corporation.

Celite Products Corporation, of Windsor House, 46, Victoria Street, S.W. 1, have published an interesting new bulletin entitled "'Silocel' Insulating Materials and Allied Products."

"A. & M." Clock Controllers.

We are advised by Messrs. Alder & Mackay, Ltd., gas meter manufacturers and street lighting engineers, of New Grange Works, Edinburgh, that they are now producing a clock controller for distance lighting of street lanterns, as an alternative to their well-known pressure-wave type. With the exception of one small part, the new "A. & M." clock controller is an entirely British production. It is constructed to give 15 days' run, and power is maintained on the driving spindle during winding. The firm do not favour cut-off by-passes, and the standard instrument is of the constant type. They are nevertheless prepared to supply the former if requested; and while the tappet action is quick, there is a slight delay to permit the pilot light to ignite. The valve is of the rotary ratchet type, similar to that employed so successfully in their pressure-wave controller, and the motion for operating it consists of only two working parts—an actuating cam and a thrusting pawl. The valve is easily accessible, and is protected against dust by a cast metal shield. Messrs. Alder & Mackay are of the opinion that, given the requisite pressure wave, and adequate mains and services to ensure its reaching all points, the most efficient and inexpensive apparatus is their pressure-wave one. Unfortunately one result of the greatly increased demand for gas is that the wave is too frequently absorbed before it reaches the further extents of some distribution systems. Hence the introduction of the alternative type.

Cheaper Gas in Kirriemuir.—The price of gas in Kirriemuir is to be reduced. A satisfactory year's working was reported at the annual meeting of the Kirriemuir Gas Company, Ltd.—Mr. John Valentine presiding—when it was stated that during the year there had been a considerable increase in the gas consumed. It was resolved to reduce the price by 5d. per 1000 c.ft., which now makes the price 5s. 5d. The meeting declared a dividend at the rate of 10 p.ct.

Metropolitan Gas Company of Melbourne.—Messrs. John Terry & Co., Agents for the Metropolitan Gas Company, Melbourne, have received a telegram from the Company informing them that the net profits for the six months to June 30 last were £124,200. A dividend of 7s. 6d. per share has been declared; an amount of £25,000 has been transferred to reserve account; and a sum of £62,850 has been carried forward. Dividends are payable in Melbourne probably today, and those to absentee shareholders will be posted by an early mail.

Weymouth Consumers Gas Company.—In the report of the Directors which is to be presented at the half-yearly general meeting to-morrow, it is stated that the sales of gas again show an increase; the amount sold for the half-year being 517,918 therms, or 112,590,800 c.ft. This, compared with the corresponding period of last year, shows an increase of 2,415,200 c.ft., or 2·19 p.ct. The receipts from the sale of gas exceed those of a year ago by £463. After providing for the interest on the debenture stock, the balance at the credit of the net revenue account is £16,517, out of which the Directors recommend the payment of a dividend on the ordinary stock for the half-year at the maximum rate of 5 p.ct. per annum, less income-tax.

Newry Gas-Works.—The report of the Ministry of Home Affairs' (Northern Ireland) Auditor regarding the accounts of the Newry Gas-Works stated that the result of the year's trading was a profit of £754, as compared with a profit of £997 for the previous year—a decrease of £239. The balance in favour of the Gas Committee's revenue account stood at £1595 at the end of the period of audit, as compared with a balance of £2076 at the close of the previous year. Mr. Griffin, at the Urban Council meeting, stated that this was a proof of the success of Socialism in a small way. Mr. Bell said it was a tribute to the prices charged for gas. The public would greatly appreciate a reduction. The Clerk observed that the price had already been reduced to 4s. 7d. per 1000 c.ft., and Mr. Ruddy remarked that in a short time they would see a further reduction. The report was adopted as being very satisfactory.

The decision of the Bingley Urban Council to apply to the Ministry of Health for permission to borrow £60,000 for proposed extensions at the gas-works is meeting with opposition from the Bingley Chamber of Trade. The Chamber contend that the expenditure proposed is larger than is warranted at the present time, and that, while certain alterations are necessary, the scheme should be a less costly one.

The Bideford Gas and Coke Company, Ltd., have notified consumers at Westward Ho! that the local gas undertaking has been purchased by them. The Bideford Company are now making arrangements for the installation of a compressing plant at their works, for the purpose of delivering gas under pressure to the Westward Ho! district. An early start is to be made in laying the main for the new supply, which it is hoped to have in operation as from the date of the transfer, Sept. 30.

During the annual visit of the Honourable Irish Society from London to Co. Derry, Mr. D. H. Christie, the Chairman of the Coleraine Urban Council, in the course of a speech concerning the status of the town, took pride in pointing to the gas-works as a model concern. The gas-works, he said, was one of the first municipal undertakings of the kind in Ireland, having been established as far back as 1845; and its career had been one of uninterrupted prosperity. It was a valuable property, and was free from debt.

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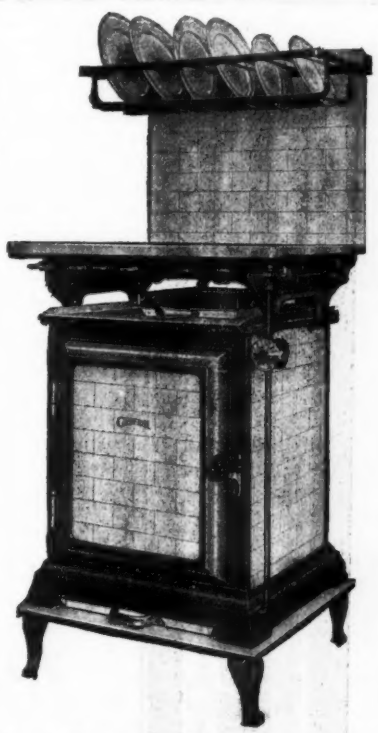

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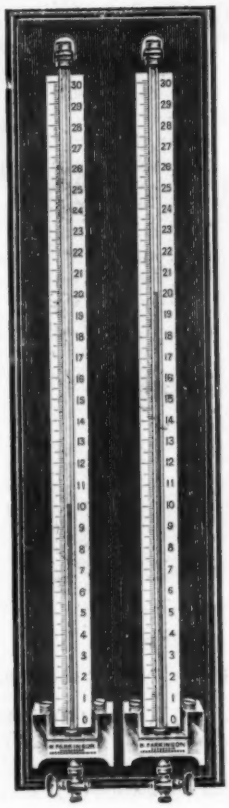

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